

# COMMERCIAL CAR JOURNAL

with which is combined Operation & Maintenance

Reg. U. S. Pat. Off.

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JUNE, 1939

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Heavy Load  
Heavy Mountain Grade  
Service Brakes  
**GONE!**



—and again **TRU•STOP**  
**EMERGENCY BRAKES**  
*brought them home Safely*

\* One of many letters from users tells how TRU-STOP Emergency Brakes brought a heavy truck safely down miles of steep mountain road when the service brakes gave out. The terrific heat developed at the braking surfaces of an ordinary emergency brake would have burnt out the linings.

Every TRU-STOP gets rid of braking heat very quickly. "The disc does it." Every disc is ventilated so thoroughly that heat is at all times being rapidly removed. A number of emergency uses do not impair its efficiency. This is one reason why disc brakes are used on the newer streamlined railroad trains.

You won't hire reckless drivers. Why depend on anything but the most reliable brakes? Savings through avoiding an accident are often enough to equip a whole fleet with TRU-STOPS. Then real brake economy begins for the fleet.

## Why

### TRU-STOP Discs Brake More Safely

The brake engineer of one of the largest truck manufacturers tested a contracting-band propeller-shaft brake on a 12,500-pound vehicle against a TRU-STOP that had only 65% as much brake lining surface. He says:

"A few light and two heavy applications of the band brake from 20 M.P.H. completely ruined the lining. ... The disc brake was used repeatedly to stop the vehicle from 50 M.P.H. and was also used to decelerate on steep grades without serious damage to the lining."

The answer is ability to dissipate heat.

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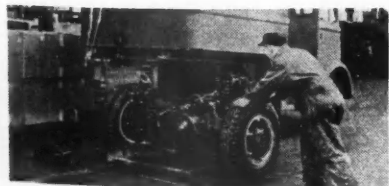
By converting a standard International D-2 panel (top) into a "Jim Crow Black Maria," another into an ambulance (above) Macon, Ga., got handsome cars and saved a plenty



High-tensile steels helped keep the weight of this 26-foot Trailmobile to 7500 lb. including all equipment. Tractor is by White



The largest Mack-built semi-trailer hauls 10-ton loads for Cushman. Mack Tractor too



Here's proof that production is under way on the new White Horse package delivery

COMMERCIAL CAR JOURNAL  
JUNE, 1939

## TEARS TO THE Ground

### Tension Tantalizer

An old established tool maker broke down and confessed to one of our agents the other day that he could not hold out on this department much longer and that if promptness was one of our qualities we could be the first to tell the waiting world about his new tension wrench. No mechanical details, but the price is \$11.50.

### Valve Verse

An agent who has been very successful in playing the waiting game suggests to this department that it wait with him and see if a manufacturer long known for his engines with unadjustable tappets doesn't incorporate a zero lash arrangement in cars and trucks for 1940. Said agent also ex-

pects similar equipment on a class passenger car for next year but this department does not concern itself with luxury transportation.

### Body Blackboard

The ellipses, hyperbolas and parabolas scattered around on drawing boards have already begun to take on meaning to anyone who understands such things and this department's interpreter says that they portend a flock of radical bodies on passenger cars next year.

### Dump Declaration

A company that up to this time has been completely foreign to this department is coming into the truck industry with a line of dump bodies and hoists. Just by luck our agent with something else entirely on his mind caught this one before it had a chance to bounce.

### Brake Boom

At least two entirely independent organizations were shadowed by our operative and found to have some new braking systems for heavy-duty service well under way. Some of the equipment has been on the road for many miles of actual operation. It's still too early to make a definite statement, but you can look for some important news before long.

### A Tachometer Parlay

Two intriguing leaflets just released by Stewart-Warner direct attention to the operating advantages of its new Motor-Mile Tachometer. One of the pieces, directed especially at the fleet owner, briefly describes the device and points out how it can be of help to the driver and can go a long way toward reducing fleet costs. The other leaflet talks shop to the driver and shows how the tachometer can make him more efficient and his job easier and safer. Check "A" on the post card.

### Rayon Tire Data

Some remarkable statistics on the performance of the new U. S. Raymaster truck tire are contained in a 16-page booklet recently published. Stressing particularly the advantage of the rayon cord, the figures cover relative tire costs, temperatures and net power loss through the tire. For yours check "B" on the post card.

## free Books

BOOKLETS

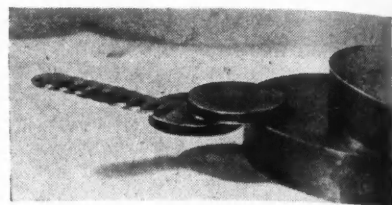
PAMPHLETS

CATALOGS

... a special selection made by the editors ... to get your copy, just check the letter on the post card between pages 104 and 105 which corresponds with the item you desire ... and mail to Commercial Car Journal, Philadelphia, Pa.

# AFTER hours

EDITORIAL COMMENTS BY *George J. Hook* EDITOR



Molecular attraction does the trick but it's only possible with a flawless super finish such as developed recently by Chrysler Corp.

## 1. What War Would Mean to the Truck Industry. 2. Will Examiner Snow Find a Need for Regulating Private Trucks?

### What War Would Mean to the Truck Industry

**DOES** business want the United States to go to war in Europe?

Associations of businessmen are formally on record saying that business does not.

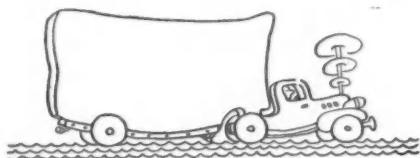
Rabid anti-war elements that pretend to know the mind of business

better than businessmen themselves, assert that business does. In Congress, in the press and over the radio these elements are blaming business for the current propaganda which seems to have as its aim the preparing of Americans for active participa-

tion in the settling of European affairs. These elements argue that business favors war because it has much to gain from so horrible an event.

Now the term "business" covers a lot of ground and therefore must include the business of manufacturing trucks and the business of operating trucks for a livelihood. Assuming the same right to think for the truck manufacturing and the trucking industries that critics assume, we say without reservation that these indus-

## The OVER Load



### Marginalia

This issue of CCJ seems to have the truck industry well in hand, as always. For the mechanical crew there is an article on "Varnish," the kind that gums up engines not the kind that gives paint that lustre. Can be found on page 20. Believing that for a whole month the shop library should contain information on more than one phase of maintenance, this article is accompanied by Shop Hints . . . five capsule, experience articles. The prescriptions are on page 24. Towards the back of the book, on page 25, Fleetman R. E. Rowley, of Los Angeles, tells you what can be done with a dynamometer in your shop. The second article in the diesel maintenance series takes the GM diesel injector apart and puts it back together again in working order on page 32.

### Cause for Pause

H. O. Mathews has some things to say

that should interest the boys that pay the bills and he says them on page 22. He tells why costs have come down in some fleets where vehicle selection has kept pace with design. He also makes a few suggestions for further economies. While on the subject of costs do not forget that you have a stake in the roads as well as in your truck equipment. Neither would be much good without the other. On page 30, James G. Ellis gives the toll road idea a pretty thorough going over in a factual way and the answer seems to be "Phooey."

### Lyric for Laundries

Designer Westberg renews his acquaintance with those interested in bodies. He uses a laundry body to keep the conversation interesting and to vary his main theme of better and better looking bodies. Mr. Westberg's publication address is page 26. Fleetman Henry J. May, of Chicago, tells you how "the last shall be first." He did



## ccj QUIZ

Everybody starts even on this month's quiz since everybody knows 26 letters. All you have to do is know when and where to apply the letters that you know. On the basis of 10 points for each correct answer, tell the boss how good you are if you score 90. If you get 80 do not blush, and if you make 70 or less write to Robert Bahl, Bendix-Westinghouse Automotive Air Brake Co., who thought up this quiz and tell him that it was too stiff.

### (Correct Answers on Page 46)

1. Don't let this one put the brakes on

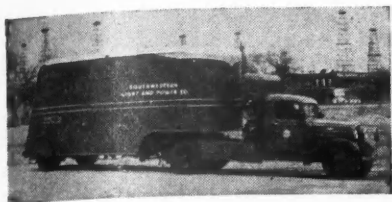
you. If you had a Timken brake with lining  $\frac{3}{4}$  in. thick, you would know right off that it was of the

- a. W type                      c. A type  
b. TW type                    d. H type

2. Here's a chance to use some head work. Which of these engine head designs is often referred to as the "valve-in-head" design?

- a. L type    b. T type    c. I type

3. See if you can rise to the occasion to let us know which of these is otherwise known as the "constant-rise" cam



Newcomer to the utility field, the Fruehauf "semi", with two-man crew, packs everything needed for full sub station maintenance



Gordon Bakeries use the 2700-gallon stainless steel tanker (powered by Diamond T) to haul milk direct to the powdering tank



Six times daily, Jimmie Lynch, the Texas death dodger, flies through the air to entertain Goodrich visitors at New York Fair

tries do not want the United States to go to war in Europe. They certainly oppose the idea on humanitarian grounds and, for the record, we shall set forth some of the reasons why they oppose the idea on economic grounds.

What can the truck manufacturing industry expect in the event the United States goes to war? First, it can expect the government to declare the motor truck a defensive and an offensive weapon of war. Second, it can expect the War Department to

set into motion its plans for standardization of equipment. The War Department already knows all it needs to know about factory productive capacities. When war is declared it will simply issue orders. Officers will be stationed at the factories to see that they are carried out. Third, Congress will pass a law taking the profits out of war materials, among which trucks will be included.

Add to all this the passage of a law like the May bill now before Congress, whereby each citizen will be

told where he shall work, what his wife and children shall do, and how much they shall be paid, gage its effect on factory management and try, if you can, to gage the economic value of war to the truck manufacturing industry.

We see only orderly confusion with management being told what to do and how to do it; with unprofitable war orders taking precedence over profitable orders having nothing to do with war; the demoralizing effect (TURN TO PAGE 42, PLEASE)

it with his Boston Store fleet in safety contests during a three-year span. Look on page 28.

#### Answer to Inquiries

Leaving the issue in your hands but still on the subject of safety, the editors who never seem to catch up with their correspondence, hereby answer a whole flock of queries all at once by stating that the Williams Jewelry & Mfg. Co., Silversmiths Bldg., Chicago, Ill., make a safe driver emblem finished in enamel and gold. Suspended from the emblem is a merit bar which can be changed as the driver piles up the years on his "no accident" record. If the safety budget is a little shy you can take the merit bar back from the driver as he adds a year, give him his new one and give the old one to a driver who is just a year behind him. The emblem stays the same. The manufacturer tells us that he will be glad to send a sample to

any operator who writes for one on his own letterhead.

#### The 13 Original Diesel States

James E. DeLong, president of the Waukesha Motor Co., gathered statistics from 13 states (all he could get) and found that in these 13 states there are 2221 diesel engine trucks. The eastern division total adds up to 750 trucks and the western division to 1471. California, Washington and Oregon, considered leaders in the dieselization movement, accounted for 1176 trucks of the western division's 1471. He makes an estimate for the 48 states 4900 diesels in trucks and buses.

#### It Can Happen Here

J. Andreau, a French consulting engineer, in a paper on modern light European cars, said, "I believe for a long time, even since the first automobile crept along our roads, the tax collector has been the chief

engineer in all countries of Europe."

#### Contest Closes

On May 15, the CCJ "How Our Shop Reduced Fleet Operating Costs" contest closed when postoffice cancelling machines stamped last-minute entries with the hour of midnight. The prize decisions are now in the laps of the judges. We wish all those who participated the best of luck. The winners will be publicly announced in the August issue.

#### Contest Opening

We are always on the lookout for new ideas. Perhaps you have an idea for another prize contest which CCJ might sponsor. Let us have it. What kind of a contest having to do with fleet operation would you like to participate in? Think along that line. We'll give a brand new Stetson hat to the one that sends in an idea that is accepted.

#### General Motors?

- a. A. C. c. E. W.  
b. A. P. d. E. L.

7. Don't dodge this one. To what series does the 1939 vintage of Dodge trucks belong?

- a. M series c. S series  
b. R series d. T series

8. Now we belt you with this one. Just what is a "V" belt?

- a. A belt used on a V-8 engine.  
b. A belt, the cross section of which is in the shape of a triangle  
c. A belt, the cross section of which is in

the shape of a trapezoid

d. A belt used with a three pulley train

9. We should be D-lighted if you told us in what year the D series of the International Harvester came out—

- a. 1936 c. 1938  
b. 1937 d. 1939

10. You've surely heard of B-K vacuum brakes. Show us that your mind isn't a vacuum by telling us what those letters stand for.

- a. Brake Kontrol c. Bendix-Koppers  
b. Bragg-Kliesrath d. Bendix K series

- a. A type c. S type  
b. O type d. U type
4. What letter in a Studebaker model designation indicates that the model is of the cab-over-engine or cab-forward type?

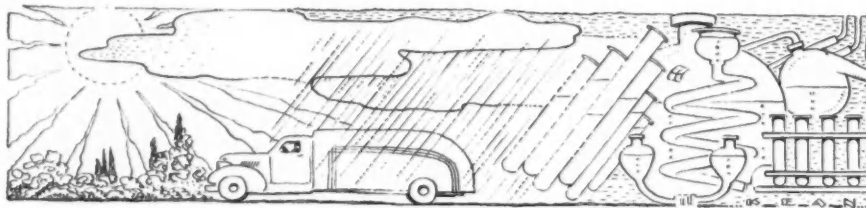
- a. The letter J c. The letter D  
b. The letter K d. The letter M

5. Now, how about the G.M.C.? Which of these letters tells you at a glance that the model is a cab-over-engine?

- a. The letter A c. The letter D  
b. The letter C d. The letter F

6. Initial this one off, please. What are the initials of Mr. Sloan, the president of





**A**PPARENTLY the only positive thing known about the varnish or lacquer formation in the engine lubricant that is plaguing fleet operators to some degree is that no one has much positive information on it. It is found in some engines at internal inspection periods, covering surfaces on the piston skirt, on the connecting rod, on valve stems, on valve lifters and other parts. It hardly ever accumulates in the catch-alls, such as ring grooves, with the result that it hardly ever causes rings to stick. However, it is sometimes confused with sludge by the uninitiated, so occasionally it is accused of being a prime ring sticker.

The manifestations by which it makes its presence known are sticking valves, sticking valve lifters and occasionally, in severe cases, engines seizing when hot and refusing to turn over by starter power until cooled. It seems safe to guess that varnish will increase internal friction before any of these things happen and even in less severe cases interfere with output and fuel consumption.

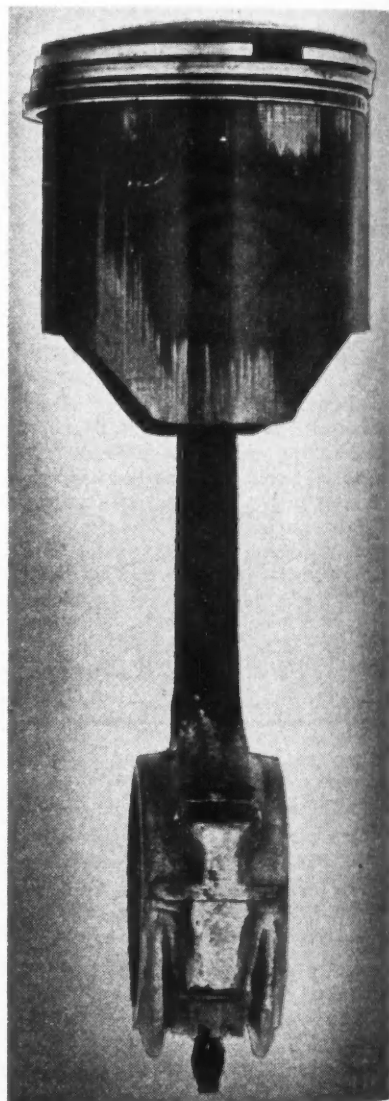
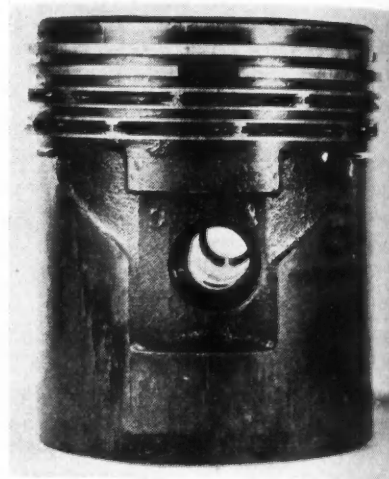
Sludge is well recognized as a product of a cold running engine or one that is intermittently accelerated and decelerated. Lacquer or varnish is pretty well recognized as a product of an engine that runs hot, at least in spots. Sludge in its formative stage is a black, jelly-like substance. Later in its development it becomes flint-hard and black as a result of further subjection to high temperatures and it seems to have an affinity for restricted places like ring grooves. Varnish or lacquer on the other hand usually looks like orange shellac. Sometimes it varies from that through red to dark brown. In au-

tomotive engines it is seldom black, whereas this color is the most common in aircraft engines where the problem is much more serious than it is in automotive engines. Usually the varnish is spread pretty evenly. It looks as if it had been deliberately put on with a brush.

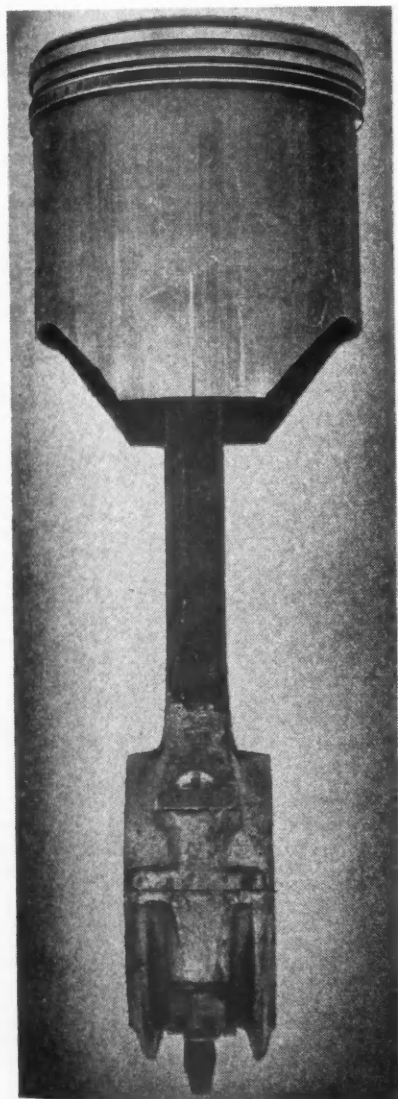
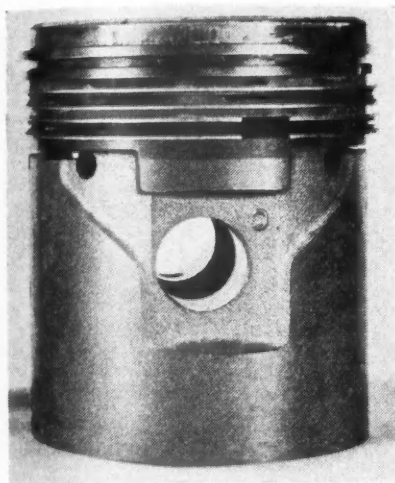
The conditions which promote varnish are so varied that formation of varnish cannot be reduced to a single set of circumstances. This much, however, can be said about it: varnish is a product of oil deterioration. This is not to say that varnish formation is a reflection on the oil. One analytical chemist stated that, as a result of his investigations, he is beginning to believe that where the conditions (whatever they may be) are right for the formation of varnish, there will be varnish regardless of the oil used. However, he admitted that some oils seem to be found in the company of varnish more often than others. Since these oils are the less stable kind, it left him with the suspicion that oils which oxidize most readily have, at least in this respect, less resistance to aiding and abetting the production of varnish.

Since heat is a pretty well recognized factor in the formation of varnish, the engine cooling system can well be considered an accessory before the fact. To prevent the formation of sludge it is a pretty good rule to operate the engine so that the oil temperature is over 125 deg. F. To prevent the formation of varnish, it is also a pretty good rule to keep the oil temperature below 275 deg. F. Keeping the oil temperature below 275 deg. is not the whole story on cooling. An engine may maintain a good oil temperature in the pan but

# The



# unvarnished truth about Varnish



**A report on the suspected causes, the known effects and the experimental remedies thus far brought to light in the field and in the research laboratory**

**The two illustrations on the left show a piston and piston and connecting rod assembly badly varnished. Those on right show identical parts without varnish**

due to mechanical design cause overheating of the oil on cylinder walls.

Whenever the temperature of a lubricating oil is mentioned it seems that the time element must also be expressed or you have not said anything. This suggests that the prevalent practice of keeping the oil too long in the engine may be a contributing factor. What with expander type piston rings and other means of preventing oil consumption the thin films of oil on the cylinder walls are exposed to a high temperature for longer periods. The result is that we save oil but may wind up with varnish.

Tied up with this time and temperature is the pressure of the piston rings on the oil film. While expander

type rings are not designed to preserve oil by increasing the ring pressure until the gap between cylinder and piston is plugged up, it seems safe to say that generally they provide greater pressure than do the conventional rings. In addition, it seems that conventional ring design has resulted in higher pressures in the last few years. This increased pressure would cut the film thinner, making it more readily subject to oxidation and at the same time increase the heat. In addition, it cuts down the oil consumption, leaving the film on the cylinder walls for a longer period.

Another school of thought is that closer clearances help to bring about  
(TURN TO PAGE 120, PLEASE)



**By H. O. MATHEWS**  
Automotive Engineer, Public Utility  
and Service Corp., Chicago

(Editor's Note: Mr. Mathews in his discussion of the light car and  $\frac{1}{2}$ -ton truck at the SAE World Engineering Congress on May 24 borrowed liberally from his own experience and that of six other public utility fleet operators. In his paper, entitled "The Utility and Economics of Small Passenger Cars and One-Half Ton Trucks," he covered 21 phases of light vehicle operation. This article covers in detail those portions dealing with operating cost trends and the effect of driving habits on costs. To it are appended the author's interesting and pertinent observations on many related angles of his subject.)

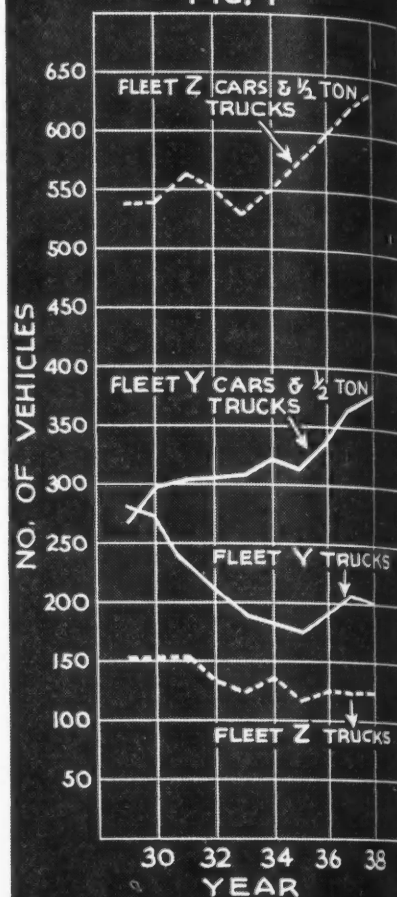
**I**N order to demonstrate a few pertinent facts relative to the operation of light cars and  $\frac{1}{2}$ -ton trucks, some actual results are given in the accompanying charts. Data pertaining to a large eastern utility fleet are shown as "fleet Y" in Figs. 1, 2, and 3. Note the gradual shift away from heavy trucks to lighter vehicles as shown in Fig. 1, and the relatively constant cost figure shown in Fig. 2. The gasoline mileage shown in Fig. 3 is of unusual interest as it reflects the change to modern cars. The best mileage was obtained when the fleet consisted of Model A Fords. There was a loss of 2 miles per gallon with

## SOME WEIGHTY IDEAS ON LIGHT VEHICLE

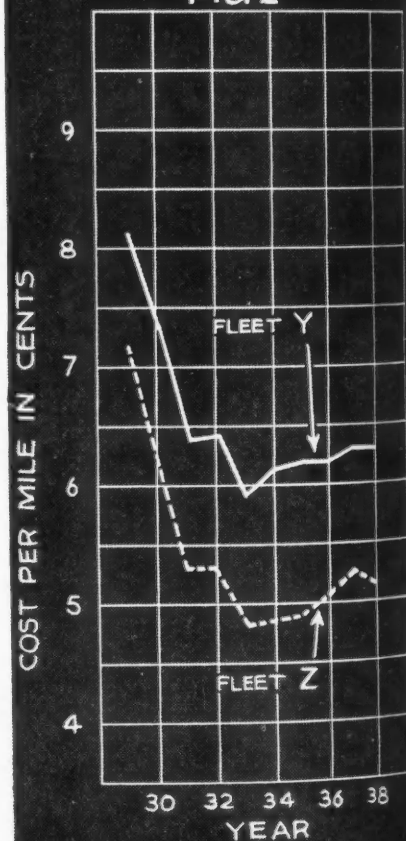
# Costs

... in which the author commends the utility of light cars and  $\frac{1}{2}$ -ton trucks, criticizes

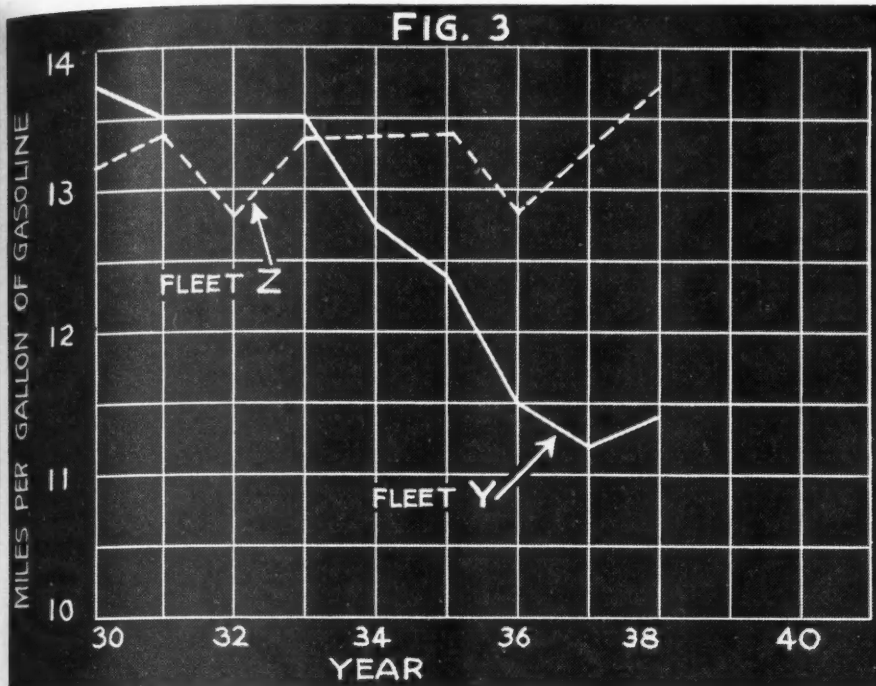
**FIG. 1**



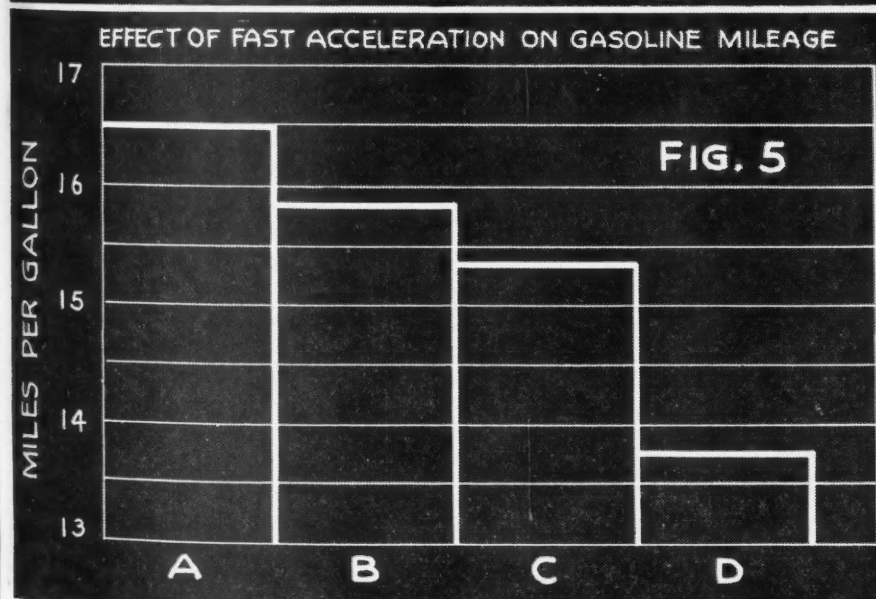
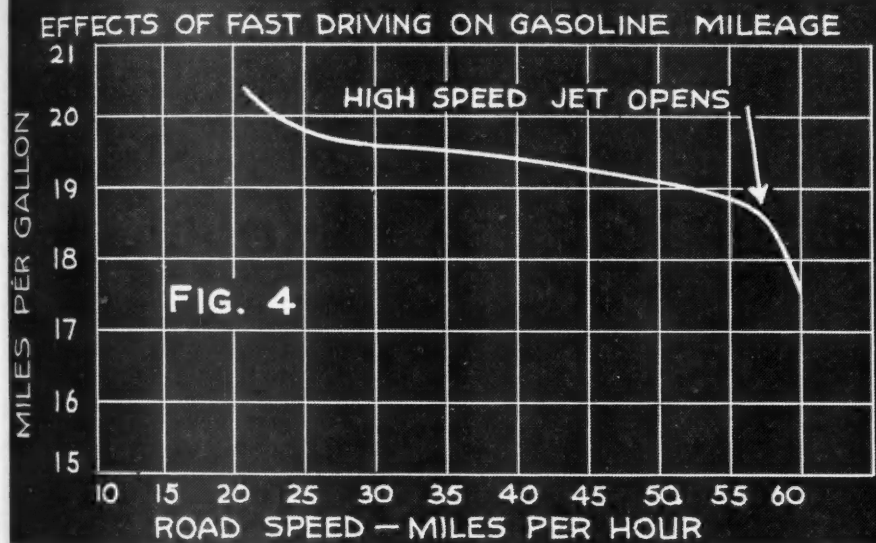
**FIG. 2**







The accompanying charts, carefully explained in the text, illustrate pertinent details of an eastern and a mid-western fleet and also show the effect of high speeds and fast acceleration on gasoline consumption.



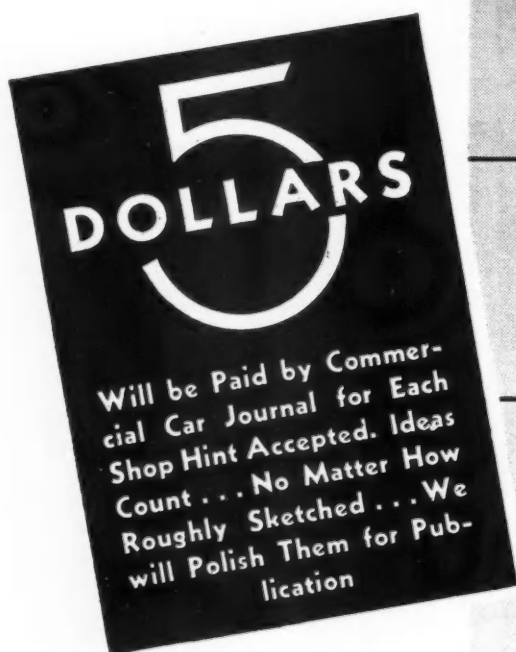
the advent of the V8 which has never been recovered. Operating conditions contribute to this unusual result, but what can the operator do about it other than to ask the manufacturer to reduce performance? Increased power and ability work to a disadvantage in this fleet operating in a metropolitan area due to traffic and grades.

"Fleet Z" in Figs. 1, 2 and 3 shows data for a similar fleet operating in the Midwest. In this case the difference in operating conditions has made it possible to keep the gasoline economy on the increase with the change in type of vehicle. One particularly large contributing factor to the improvements in this company is the improvement in all roads. Many secondary roads were wholly unimproved 10 years ago and have since been paved or at least gravel has been added. Many miles of poor roads are still in existence which are used regularly by vehicles of this fleet.

Both fleets provide excellent examples of the utilization of the passenger cars and  $\frac{1}{2}$ -ton trucks which have steadily increased while the large capacity trucks have decreased accordingly. Decreased body weights and increased capacities of the small trucks have made it possible to use them for the same payload as was formerly carried on the  $1\frac{1}{2}$ -ton or 2-ton trucks. Large crews have been reduced and in some cases two small

(TURN TO PAGE 97, PLEASE)

economy models and proves the economic importance of proper driving technique



### 1. Rebound Plate

By Gerard J. Guilmette

Coca-Cola Bottling Co., Providence, R. I.

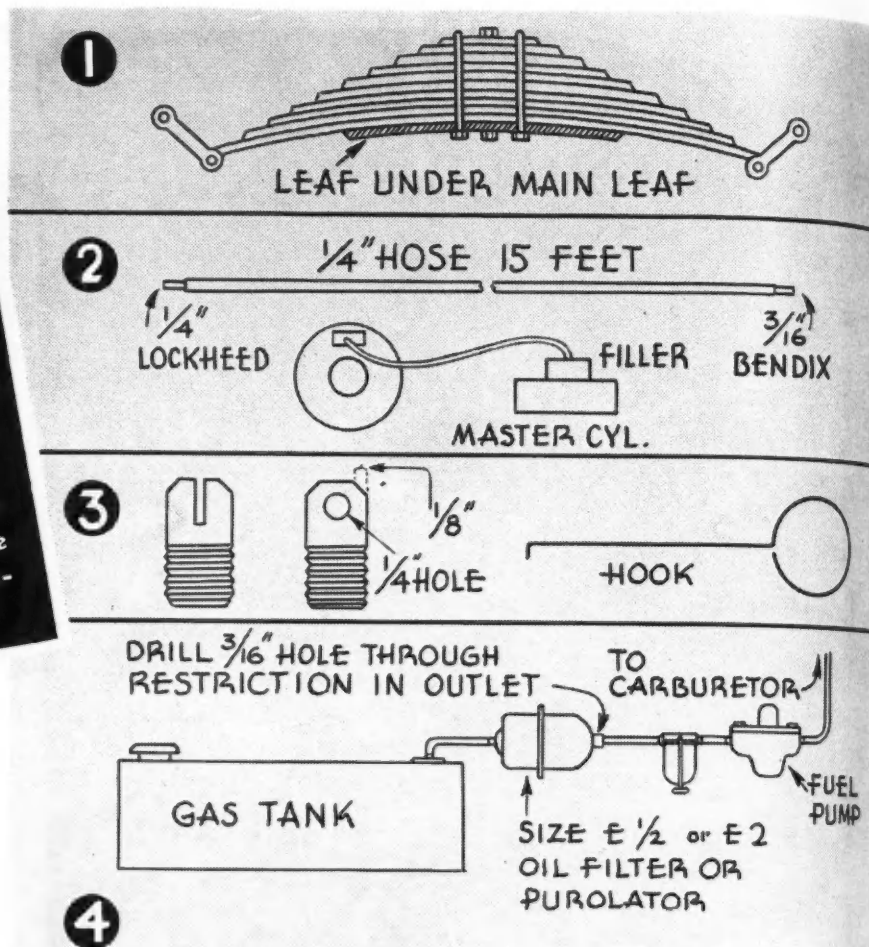
We have found that by adding a spring leaf under the main leaf of Ford front springs we prevent breakage of the spring without interfering with the riding qualities of the car or truck. The added leaf or rebound plate should be about half as long as the main leaf.

### 2. Bleeding Equipment

By August M. Schmitz

Hertz Truck Lease Service, Milwaukee, Wis.

We have made a one-man job out of bleeding hydraulic brakes and at the same time saved brake fluid. We use a 15-ft. length of  $\frac{1}{4}$ -in. hose which we connect one end of the wheel to be bled and insert the other end in the master cylinder. Then one man can pump and watch at the same time. When he completes one wheel he moves on to the next one until all four wheels have been bled.



# Shop

One Bendix  $\frac{3}{16}$ -in. fitting and one Lockheed  $\frac{1}{4}$ -in. fitting complete the equipment.

### 3. Head Aligning Tool

By J. L. Ross

State Highway Dept., San Antonio, Texas

In some of our camelbacks there is very little room to lift cylinder heads when they have to come off. Naturally they are hard to line up when they go back on. We made a tool for aligning them by taking soft steel bolts same size as the head bolts and cutting the heads off and then chamfering the tops. Then take a double

hacksaw cut to provide a screw driver slot and drill a  $\frac{1}{4}$ -in. hole as shown in the illustration. When the head is to go on we screw in our aligning bolts and set the head. Then we turn the aligning bolts out with a screw driver and lift them out with a piece of welding rod bent to a hook on one end and a finger ring on the other.

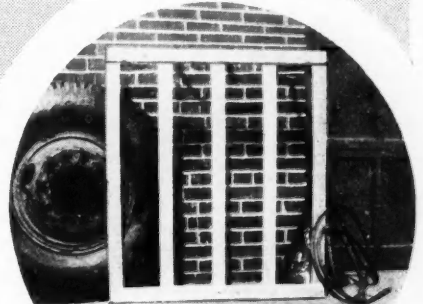
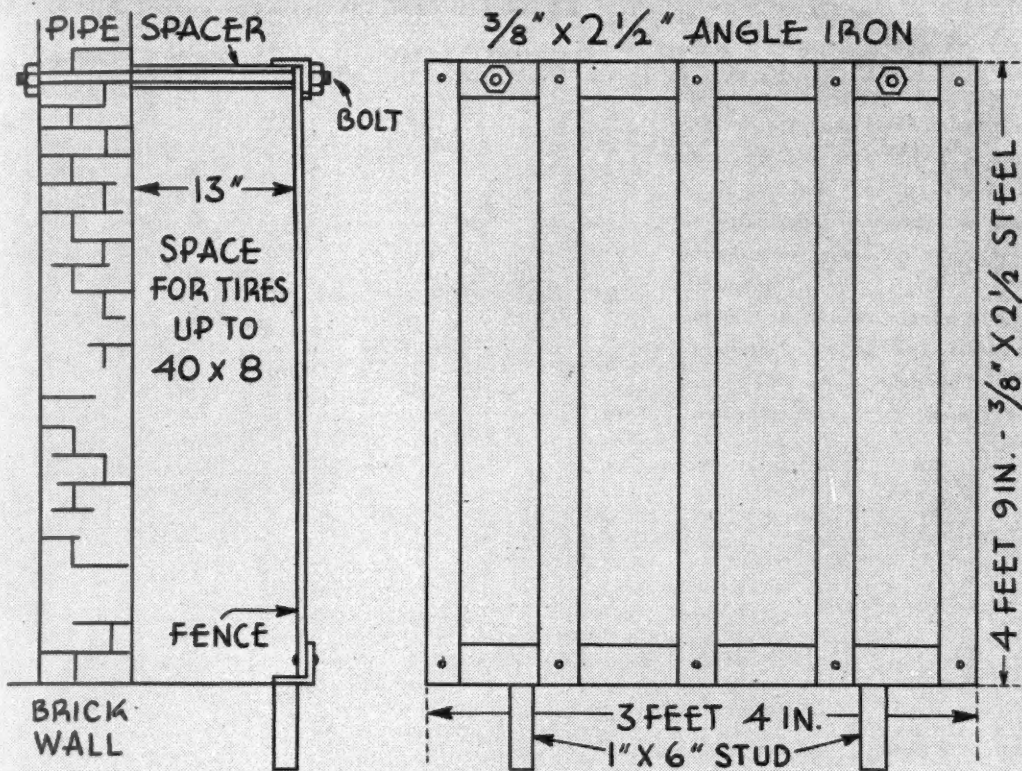
### 4. Fuel Filter

By Roger H. Miller

National Park Service Garage, Yellowstone Park, Wyo.

We have about 20 dump trucks with the gas tanks mounted on the

5



# Hints

## from FLEET SHOPS

side of the truck behind the running board. Due to this location they accumulate fine sand and this plugs idling jets and sticks accelerator pump plungers.

By installing a moderate priced oil filter in the fuel line between the tank and fuel pump we were able to eliminate this trouble. We installed a changeable type filter connecting the fuel inlet to the filter inlet and the outlet to the line running to the pump. The only change we made was to drill a 3/16-in. hole in the outlet restriction. These filters last about 1½ to 2 years in our service, which is severe.

### 5. Tire Guard

By Preston R. Coleman

Rainey-Wood Coke Co., Norristown, Pa.

For different causes tire rims sometimes fly off when inflating the large size tires and when it happens the mechanic is very lucky if he does not get hurt. To prevent injury from rims we have made a tire fence at our door where the air hose is. When we inflate a tire we simply roll it behind this fence which is bolted through a brick wall at the top and held by studs in concrete at the bottom and no one gets hurt. A photograph appears in circle above.

### Starter Gear Precaution

By R. L. Case

Leisy Brewing Co., Cleveland, Ohio

Our service consists of a good deal of stop and go driving and we find that after a vehicle has been in it two or three years that flywheel starter gears are worn in three places only because a 6-cylinder engine always stops in one of three positions. We now make it a practice when we have a clutch job to remove the flywheel and turn the starter gear 1/6 of a turn. This places the worn teeth in a different position and we save the price of a new gear plus labor.



This is the eighth in Commercial Car Journal's series of original body designs. Again we remind fleets that the designer has worked in body shops and knows the practical problems of building truck bodies. All designs are copyrighted but arrangements can be made with the designer for procuring complete construction drawings and specifications. For further details address The Editor, Commercial Car Journal, Philadelphia, Pa. July issue—a body designed for package delivery.



# THE Body of • the • month

## VOCATIONAL USES

Primary consideration in creating this design was given to city pick-up and delivery of laundry, but it is so designed that it may be used with slight variations in other vocations where a light short-wheelbase unit may be best suited.

## DESIGN FEATURES

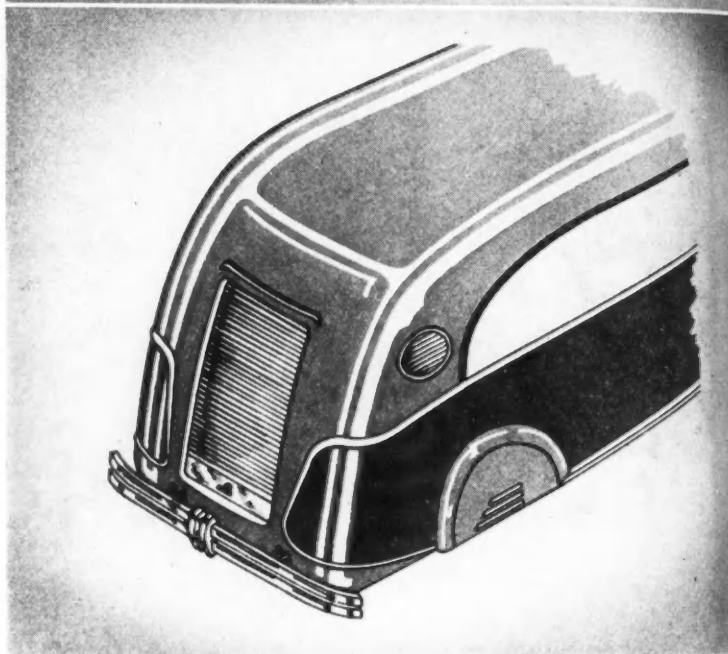
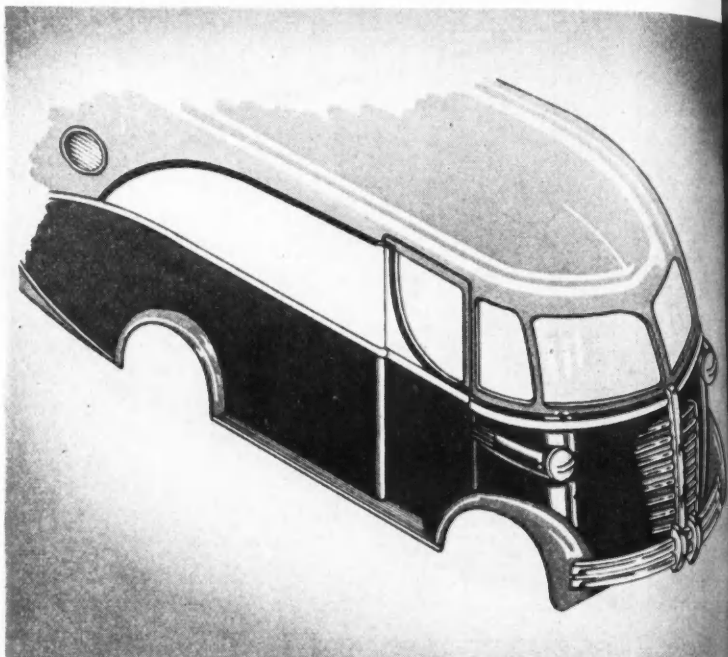
Reflecting the commercial body of tomorrow this design emphasizes modern lines, unusual molding treatment and liberal use of chrome plat-

ing and stainless steel. A modern design, different from the ordinary, is effected by generous roof quarter and rear corner radii, and by the elimination of the usual full-length roof-drip and rear vertical moldings.

## DIMENSIONS

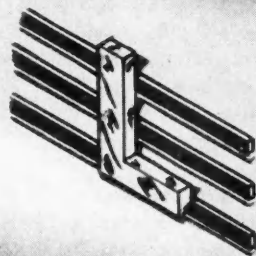
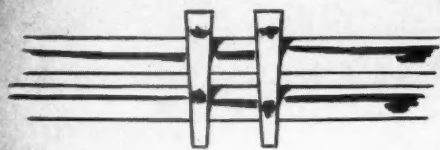
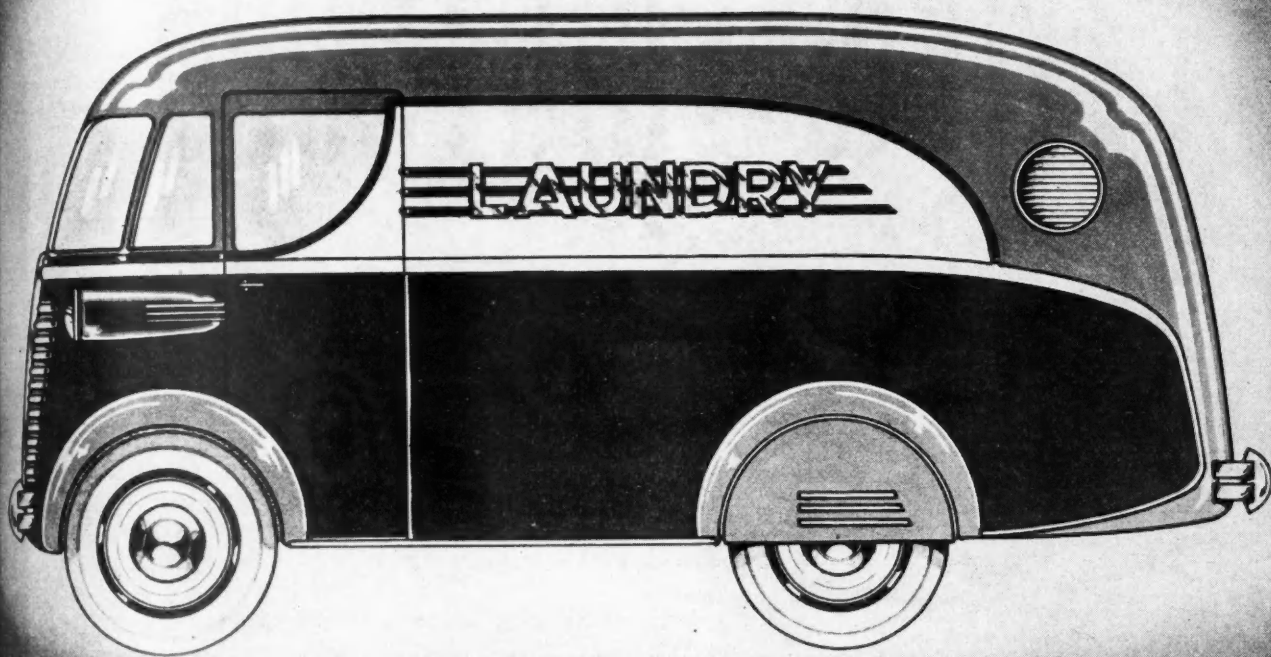
The loading capacity of the unit is approximately 290 cu. ft. which is a size well-suited to laundry work of this type. Actual clear inside dimensions are 10 ft. long, by 5 ft. 6 in. wide, by 5 ft. 4 in. high at the center.

PREPARED AND COPYRIGHT 1939 BY E. M.



## BODY MATERIALS

Construction materials consist of hardwood understructure, side framing and roof bows. The flooring is ship-lapped fir. Side panels can be either stretcher-leveled auto body steel over plywood, or metal-faced plywood. If latter is used it is suggested that light weight formed steel posts be substituted for the hardwood side framing which would save a considerable amount of weight. The roof is of hammered steel with welded joints where moldings do not occur.



#### DETAIL FEATURES

The front entrance doors to the driver's compartment are of the sliding type, which can be locked in an open position when the driver is working at short stop-and-go intervals.

The rear door is made of polished stainless steel and designed to roll up.

A partition and sliding door is provided behind the driver which allows deliveries to be made from the front of the body. This partition also keeps the load compartment

dust proof when riding and working with the doors open.

The port-hole type ventilator with spun glass air filter does two things: it enhances the appearance of the body with its stainless steel grilles and it provides fresh clean air to the interior of the body.

The front and rear bumpers are of modern design fabricated from square steel tubing and steel plate welded together and chrome-plated.

Lettering is cast aluminum polished and mounted about an inch off

of the side panels on painted wood bars.

#### COLOR SCHEME

A two-toned, one-color scheme with a second matching color in the lettering panel and on the wheels is suggested. By using a light shade of the color selected on the roof and the rear panel with the dark shade below the belt line and ahead of the lettering panel above the belt, the modern molding is emphasized and brought out to its best advantage.



From the lowest safety standing among all Chicago department store fleets in 1935, Netcher's Boston Store brought itself to the top in 1938. In 1935 the fleet's 93 vehicles encountered 101 accidents traveling 1,063,365 miles. In 1938 the same fleet, increased to 114 vehicles, had only 12 accidents covering about the same mileage. As a result the fleet won the annual trophy of both the National Safety Council and Greater Chicago Safety Council.

Because most of the fleet is still made up of the same trucks and manned by the same drivers, management credits these six principles of general supervision:

1. Expect from all drivers a good honest day's work. (This includes rearrangement of routes to assure uniform distribution and minimum overtime, and a chance for extra money during sales.)
2. Give drivers and helpers as steady employment as possible.
3. Help drivers to eliminate personal worries, including financial loans.
4. Train drivers in road courtesy and particularly to avoid traffic arguments.
5. Keep trucks in best possible mechanical condition, including daily inspection and special attention to tires.
6. Get cooperation of drivers in winning fleet no-accident awards.

The story of a Chicago fleet's spectacular climb from last to first place in a safety contest with practically the same trucks—2-wheel brake jobs at that

By HENRY J. MAY

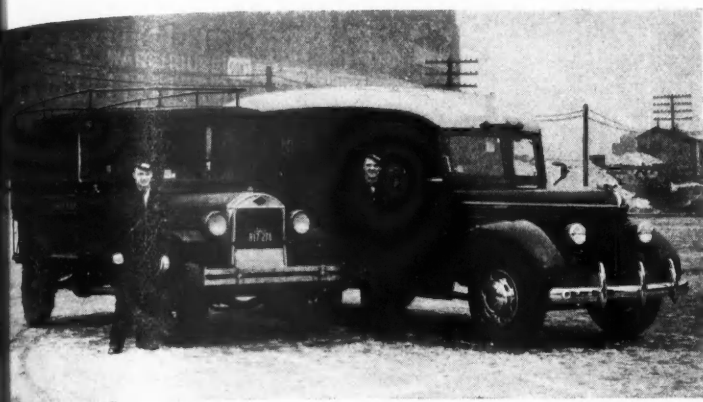
Sup't of Delivery, Boston Store, Chicago

I HAVE been asked to describe the "methods" which have enabled the fleet of Netcher's Boston Store of Chicago, within three years of time, to step from a very low-place accident record among large department stores up to the position of a winner of local and national safety trophies.

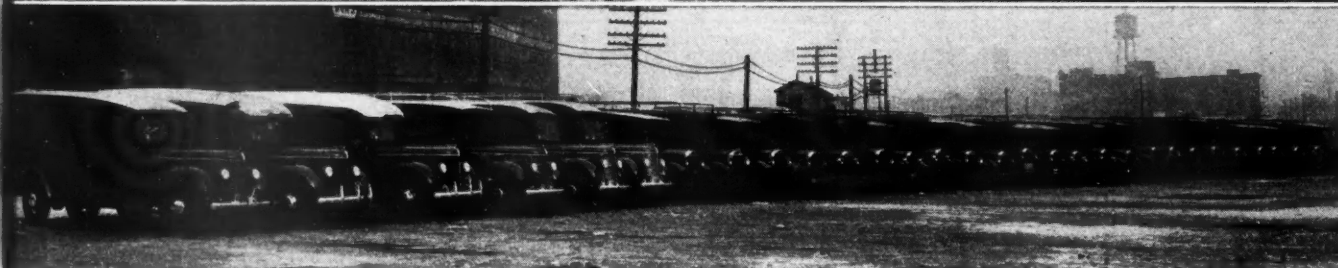
In general, I must say that we have had no special "safety methods." That is, I did not start out, about three years ago when I was appointed to the position of delivery superintendent of the Boston Store, to win a fleet safety record. Rather, I started

out to reorganize our Store trucking and delivery methods, and our improved fleet safety record has been a natural and expected partial result. Our improved management methods enabled our fleet of 114 vehicles to win the last annual trophy (for the year ending June 30, 1938) awarded by the National Safety Council, and also to win a like award for the same period from the Greater Chicago Safety Council, and an additional trophy for having made the largest percentage reductions in accidents among the competing large Chicago





Left: One of a few new trucks shown with an older counterpart. Most are Diamond T's. Below: The men behind the wheel, award winners in front center. The author is at right. Bottom: Part of the fleet.



department stores, as compared to the previous annual period.

As proof that our new fleet safety records must have been due mostly to our revised "management methods," I might add that the Boston Store today is operating practically the same fleet of trucks that we had ten years ago. That is, nine-tenths of our present trucks are more than ten years old and still equipped with two-wheel brakes. Likewise, nine-tenths of our drivers have been with the Boston Store for ten years or more. A number of these drivers have splen-

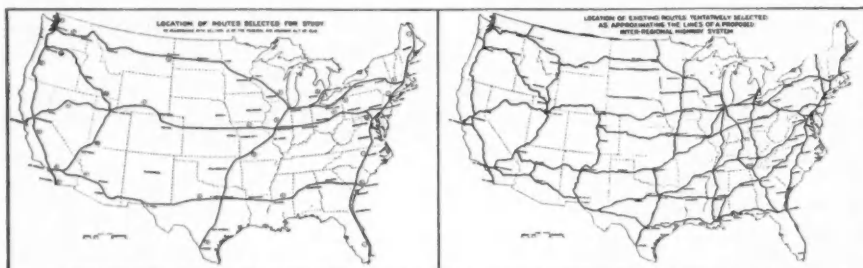
did safety records. Eighteen of them have driven for more than four years without chargeable accidents; and all of our 57 regular drivers have driven more than 3 million continuous no-accident miles.

However, when we began the reorganization of our delivery department about three years ago, our total fleet had a very poor safety record. In fact, in the annual Interfleet Drivers Safety Contest of the Greater Chicago Safety Council for the year ending June 30, 1935, the Boston Store was at the bottom of the list

among the large department stores—reporting 101 accidents for 93 vehicles which travelled 1,063,365 miles, or an accident rating of 94.9; as against 43 accidents reported by the winning store, with a rating of 30.9.

In contrast to this very poor accident showing in 1935, practically the same fleet—increased to 114 vehicles but operated by practically the same drivers and helpers, since all new and extra drivers are chosen from our helpers—had only 12

(TURN TO PAGE 64, PLEASE)



Maps above show toll road routes (left) selected for study by the Bureau and also nearest existing routes. Right: Artist's sketch of suggested intersection between U. S. Route 1 and possible belt line around the city of Baltimore

### TOLL ROAD PUNCTURE (From the Bureau of Public Roads' Report)

The three east-west and three north-south transcontinental toll superhighways suggested for study by the 1938 Act of Congress would aggregate 14,336 miles.

The cost of construction would be about \$2,899,800,000, which is at the rate of \$202,270 per mile.

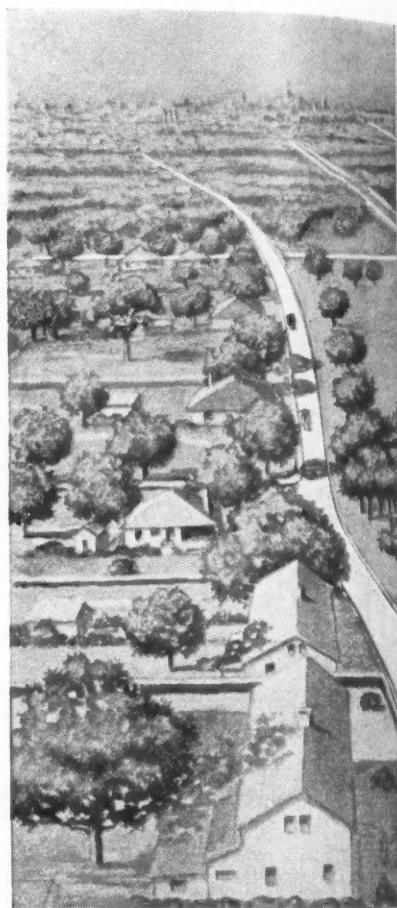
The average estimated annual expenditure for the period 1945-1960, required for financing the construction, maintaining the property and operating the facility, would be \$184,054,000,

which is at the average rate of \$12,840 per mile per year.

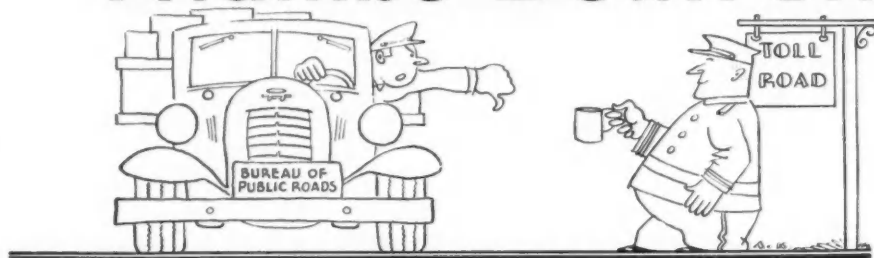
Utilization of the system would average, during the 1945-1960 period, 12,450,000 vehicle-miles per day.

Assuming toll charges of 1 cent per vehicle-mile for passenger cars and an average of 3.5 cents per vehicle-mile for trucks and buses, this travel would produce an average annual revenue of \$72,140,000.

Thus the toll system would be only 40 per cent self-supporting.



# Thumbs Down on



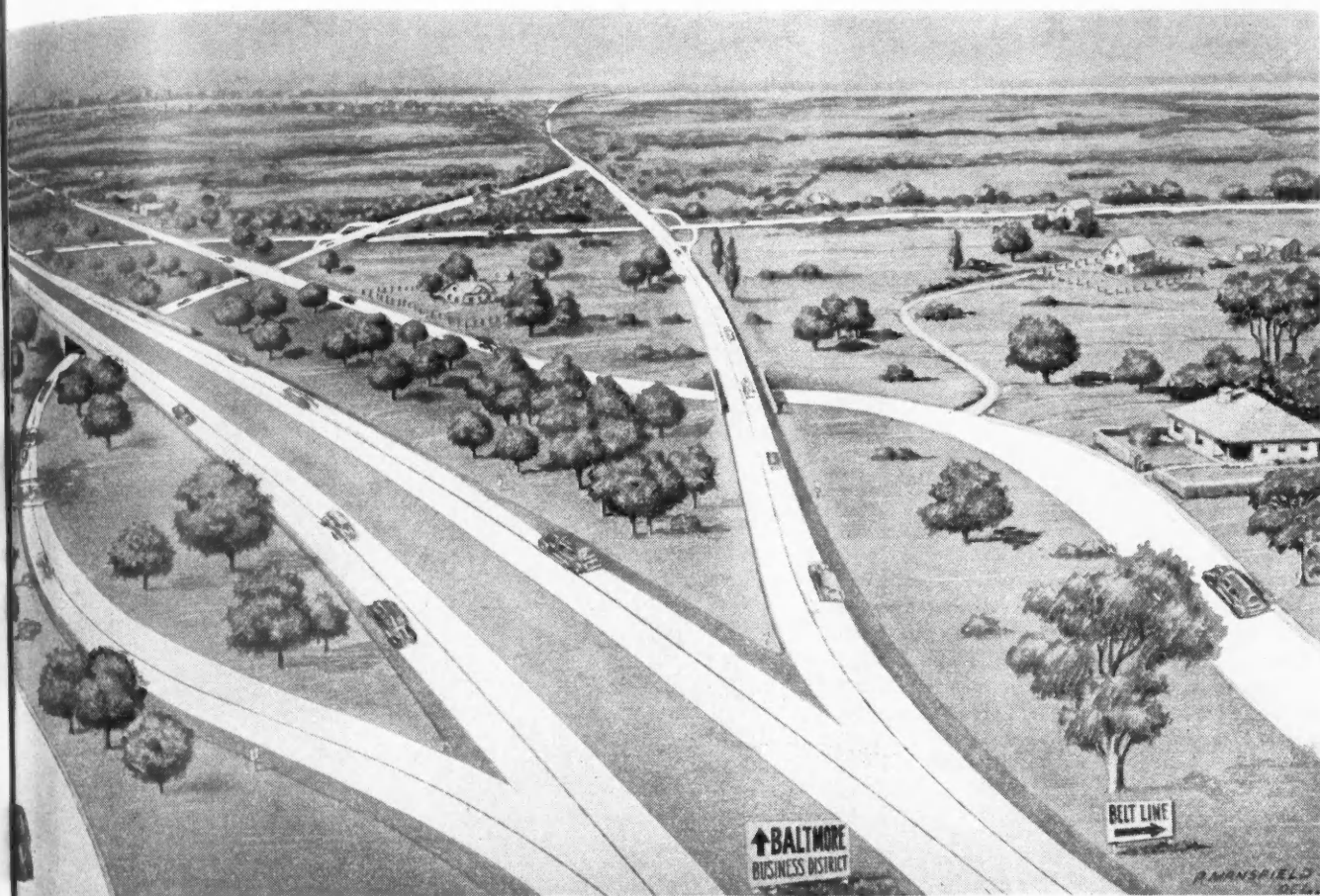
# TOLL

By JAMES G. ELLIS

**T**OMORROW'S highways will be the product of more Federal funds and greater Federal planning. Existing roads will be swallowed up by a nationally planned system whose theme will be reasonable direct connections between major cities. Linked to these will be intra-city routes directed toward business centers via depressed roads. Cities and towns

will be by-passed. Outstanding roads like the Merritt Parkway in Connecticut and the depressed boulevard in St. Louis will be widely imitated. Toll roads will be abandoned as "traffic repelling," and super-highways where drivers have to "cash in" at toll stations before gaining admission will be the exception and not the rule.

Briefly, this is the picture drawn by the Bureau of Public Roads in its 212-page report to Congress on a projected nation-wide system of toll highways proposed by road-conscious members of both Houses on Capitol Hill. The report, based upon data collected through the cooperation of state highway officials and supplemented by a message from President



# ROADS

Commercial Car Journal Washington Bureau

They are traffic repelling, says The Bureau of Public Roads in an extensive study transmitted to Congress, which proposes instead a superhighway program to be based upon existing routes

Roosevelt, who urged that it be used "as a basis for needed action to solve our highway problem," will go down in highway history as the last word on the subject. It probably more accurately reflects what will be done than any other contemporary forecast.

While the analysis will long be remembered as throwing cold water

on a few Congressional "unquenchables" who have persistently nursed the toll-road, super-highway idea through several sessions of Congress, it introduces wide latitude for those members who still desire to exercise their constitutional prerogatives in the direction of providing bigger and better roads.

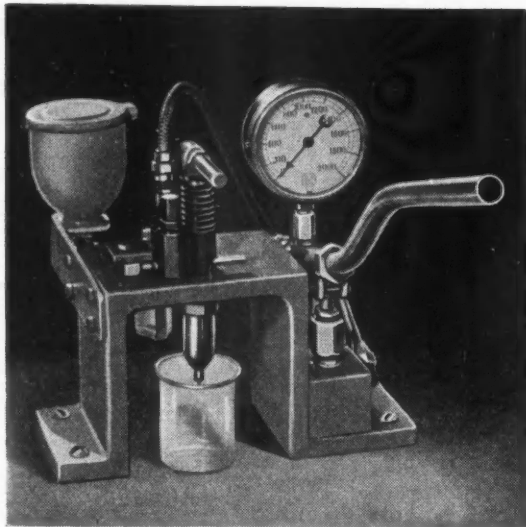
The Bureau proposed a master

highway plan calling for these joint contributions by the Federal and State governments:

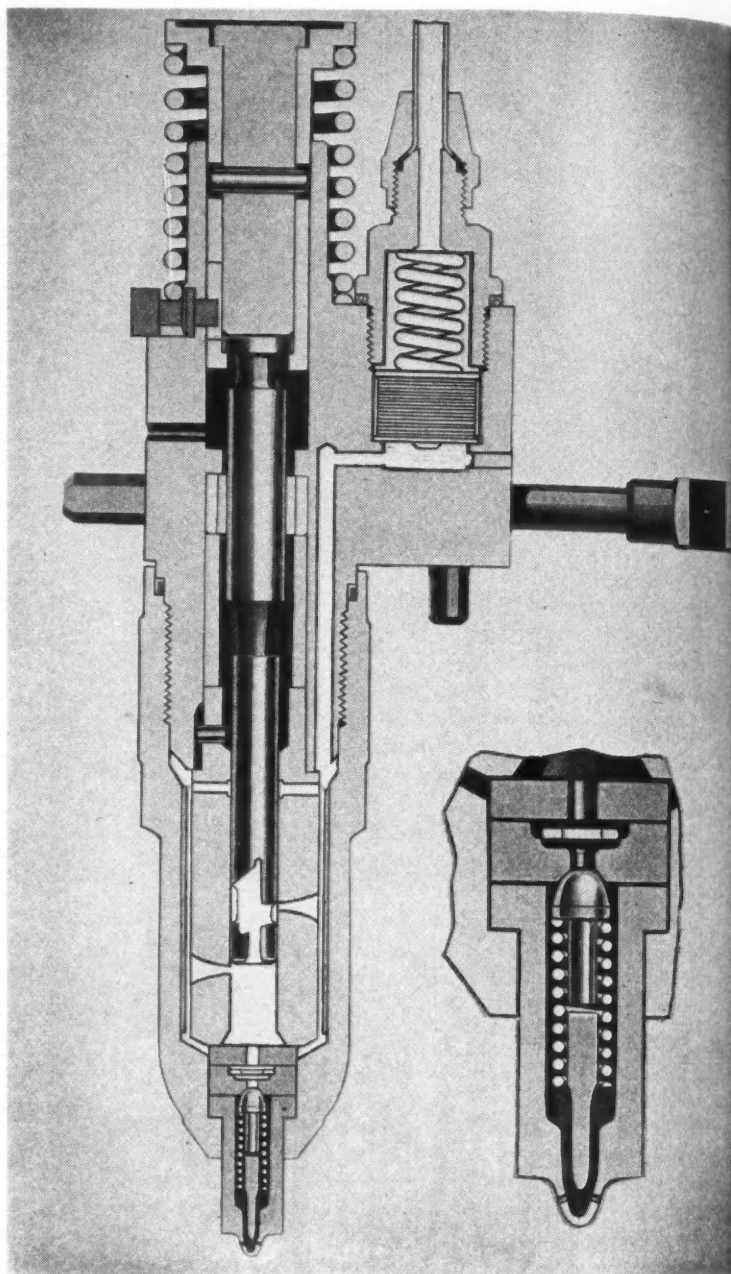
1. Construction of a special, tentatively defined system of direct inter-regional highways, with all necessary connections through and around cities, designed to meet the requirements of the national defense and the

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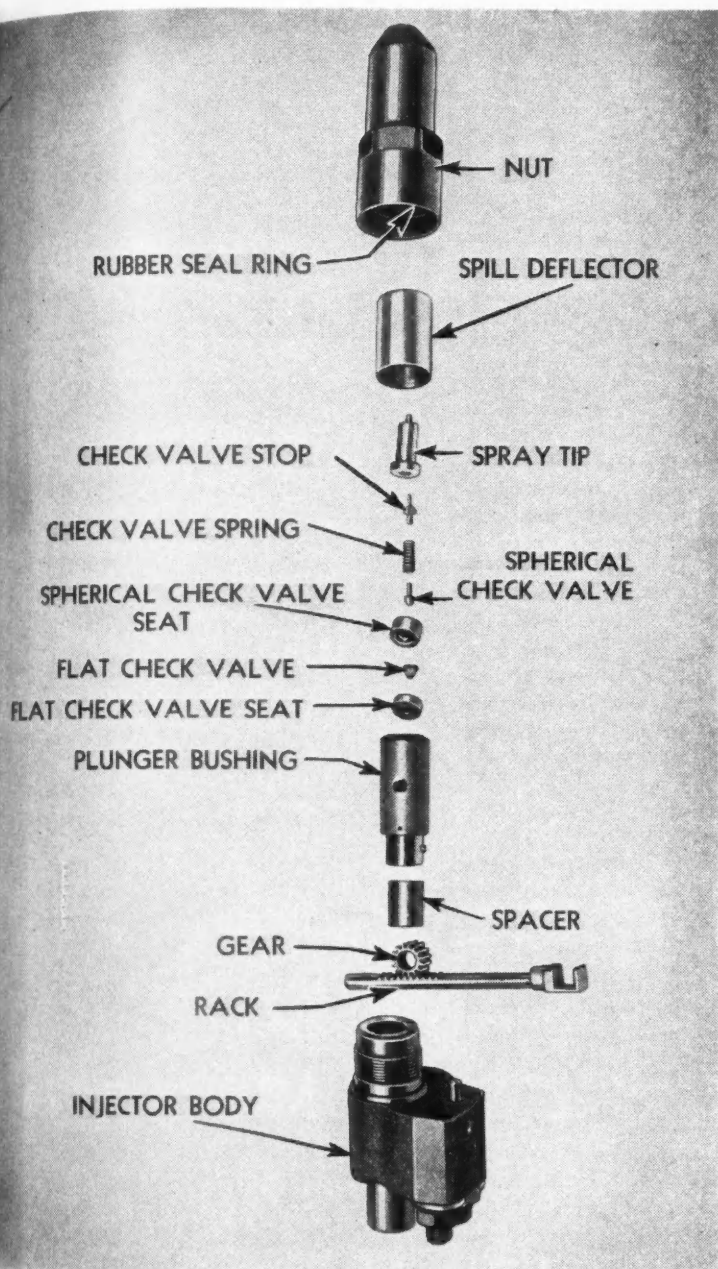


Above: Test fixture for checking injectors. Right: Cross section of the injector showing how the amount of fuel injected is metered by the travel of the plunger when the helix has stopped registering with the upper port and before it registers with the lower port. Far Right: Parts of the injector below the injector body in order of assembly.



# *Servicing* THE GM 2-CYCLE DIESEL injector

**T**HERE is no reason in the world why a fleet operator cannot service GM diesel fuel injectors if he makes up his mind that the job is just a little different from anything he has ever done. A little training and very little equipment will be sufficient to start a mechanic in this specialty. He will improve, as in all other phases of mechanical work, with experience. Because of the accuracy and manual dexterity required in electrical or carburetion work, it looks like a job for the shop



the hands can be seen through it when the occasion arises. If the work bench can be located in a room or coop apart from the shop so much the better. A wired off or boarded off corner of the tool room would be ideal.

The equipment required is a kit of injector tools, all of which, even though special, are low-priced hand tools; an injector vise, which is a fixture for a regular bench vise that holds the injector without damage to it, and testing equipment which consists of a source of fuel, a fixture for holding the injector, a lever hook-up to depress the injector plunger and a pressure gage. An air hose supplying filtered air and two enamel pans complete the equipment.

Before dis-assembling the injector should be checked on the testing equipment. Make the checks in the following order: First—examine spray pattern to make sure that all orifices in spray tip are open. Make sure that a receptacle is placed under the injector so that it will catch the spray. Do not let spray touch fingers as this spray is under high pressure and oil may penetrate fingers and may cause infection.

Second: Check pressure at which spray occurs. This should be between 1000 and 1800 lb. and should not vary more than 200 lb. among injectors of the same engine. There should be no dribbling or wetness at the tip after injection.

Third: Subject the injector to 500 lb. pressure for at least 30 seconds without dribbling and without wetness at the spray tip. Make sure that

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## A DIESEL ENGINE SERVICING SERIES

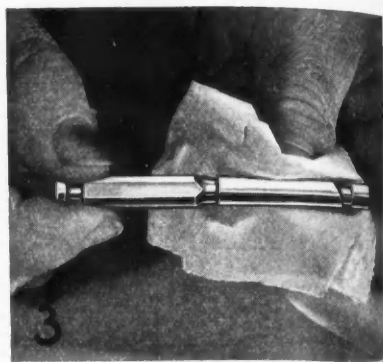
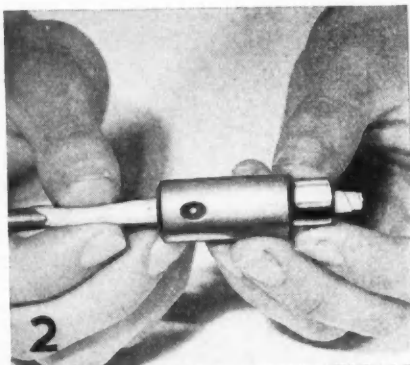
### By HENRY JENNINGS

Technical Editor, Commercial Car Journal

Servicing the GM 2-cycle Diesel Injector is the second article in the series developed by the author (third from right above) who spent two weeks studying and working on these new engines along with 13 Greyhound men. The purpose of this effort is to point out in a practical way the details that will seem new and strange to experienced gas engine mechanics so that they may approach diesel engine maintenance with confidence. These articles are not intended to replace shop manuals furnished by the manufacturers.

electrician or carburetor specialist.

One of the prime requisites for successful servicing of these injectors is a new conception of cleanliness. A bright metal surface on the work bench is desirable because it is easier to keep clean, but it is not absolutely necessary because every part as it is laid down must be placed on a clean sheet of paper. An adjustable work-light over the bench is necessary. As a matter of convenience, a magnifying glass should be fastened to it at such an angle that work in



## Servicing THE GM 2-CYCLE DIESEL injector (CONTINUED)

there is no leakage at seat nut threads.

Fourth: Take injector in hand and hold it horizontally with rack extended up. Rack should fall of its own weight. Turn injector over and check to see if the rack will fall the other way.

If the injector passes these tests it is satisfactory for service and can be put back into the engine. If it is to be stored in the stock room, it should be filled with a non-corrosive fuel oil.

If the injector does not pass the tests it must be dis-assembled, the trouble corrected and then re-assembled.

### Dis-assembly and Re-assembly

To dis-assemble:

1. Place injector in injector vise (GM No. J-1261) in inverted position. Using seat nut wrench (GM No. 1238) unscrew but do not remove seat nut.

2. Remove injector from holding vise and hold it just over No. 1 cleaning pan filled with clean fuel oil. Remove seat nut and place all parts in cleaning pan. If spray tip does not free itself from the seat nut, it can be removed with seat driver (GM No. T1032).

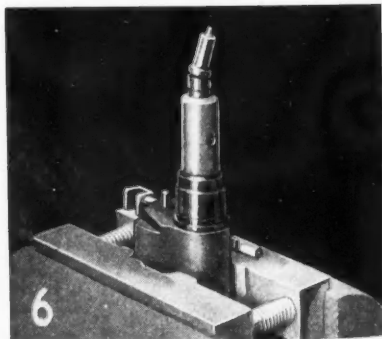
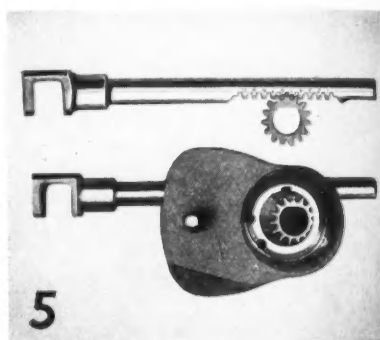
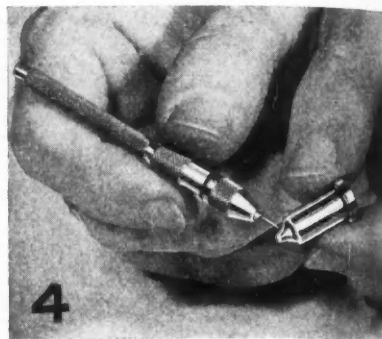
1. Dis-assembly begins by unscrewing the seat nut with injector in the inverted position in injector vise. 2. Plunger bushing bearing surface must be cleaned, blown dry and wiped with absorbent tissue. 3. Plunger must be cleaned, blown dry and wiped with absorbent tissue and not touched with the fingers. 4. Six orifices in the tip must be reamed with .006 in. wire. 5. Gear and rack must be timed according to marks. 6. Re-assembly up to and including the spray tip. 7. Hold spray tip with tool while locating seat nut.

3. Place injector in holding vise in right side up position and using screw driver (or GM No. 7647) pry follower spring out of the way and remove stop pin. As pin is withdrawn hold left hand over follower spring to prevent plunger and bushing assembly from springing outward. Place parts in No. 1 cleaning pan. Jar the rack pinion from injector body and withdraw the rack.

4. With injector in upright position in vise remove fuel connections making sure that filter springs do not spring outward. Place connections, filters and springs in No. 1 cleaning pan.

5. Brush all parts thoroughly making liberal use of cleaning fluid from No. 1 pan. Blow parts dry with filtered air. Repeat process several times. This is important.

6. Check plunger and bushing through magnifying glass for any trace of mechanical damage. If there is any these parts must be discarded. Since the plunger and bushing are lapped together they are not replaced separately. If there is no mechanical damage place these parts in No. 2 cleaning pan full of clean fuel oil or carbon tetrachloride and rinse thoroughly. Dry with filtered (TURN TO PAGE 92, PLEASE)





# DYNAMOMETER

*June ups*

(Editor's Note: Excerpted as of particular interest to fleetmen, the following comments are from a paper entitled "Engineered Automotive Operation and Maintenance" addressed to the Engineering Congress of the Society of Automotive Engineers in San Francisco. Mr. Rowley is in charge of the engineering section, General Plant Division, of the Department of Water and Power, City of Los Angeles. Together with the fleetmen, whom he quotes, he is well qualified to speak on the usefulness of the chassis dynamometer as well as upon the importance of acceptance tests for new equipment.)

**S**TATISTICAL studies of road failures reveal a surprising number of adjustment deficiencies in new equipment. These are probably due to the human element in factory line production methods rather than to engineering. Defects found in the acceptance tests of 26 new cars received during one month are listed as follows:

No. of Cars	Defect
23	Loose wiring
20	Loose manifold bolts
18	Wrong ignition timing
7	Loose vacuum line nuts
7	Wrong valve clearance
6	Insufficient distributor point clearance
5	Wrong carburetor float level
3	Loose carburetor mounting
3	Loose fan hub bolts
1	Gas gage defective
1	Generator cut-out loose
1	Fuel pump loose
1	Loose cylinder head bolts
1	Defective carburetor

This and similar records have  
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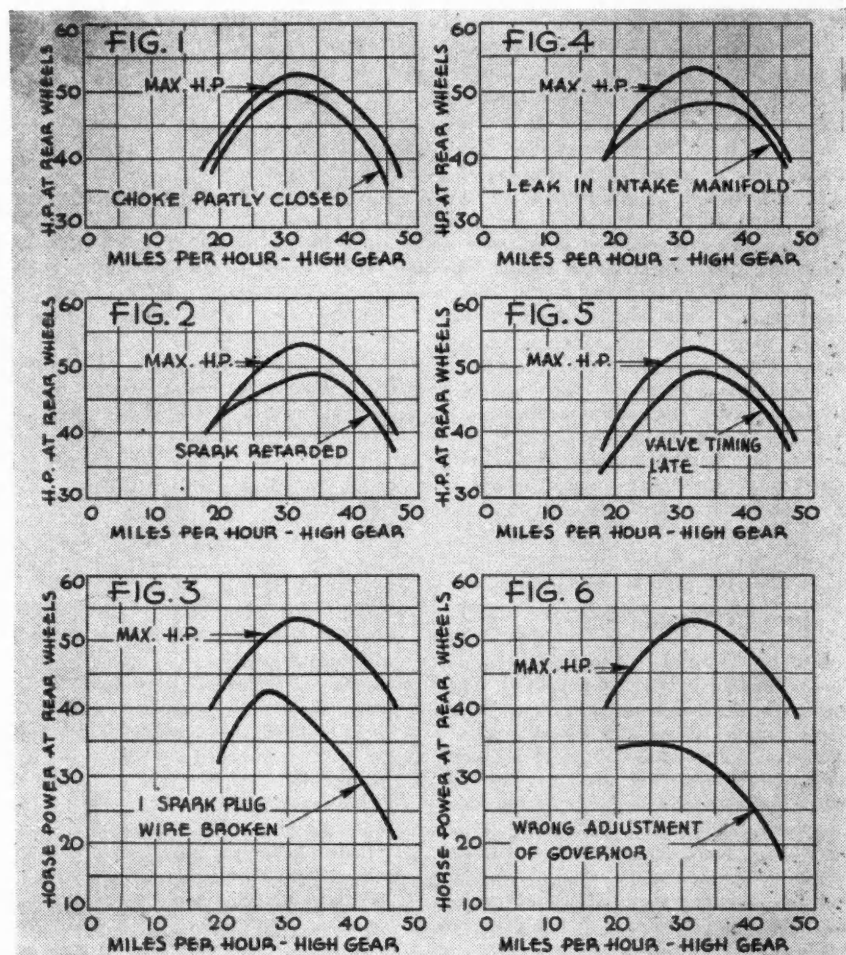
The charts show net horsepower loss as a result of various common ailments. See text for full description

COMMERCIAL CAR JOURNAL  
JUNE, 1939

**Modern tune-up tool makes old trucks young and young trucks bold, according to fleetmen who describe its use**

**By ROBERT E. ROWLEY**

Engineering Section, Department of Water and Power, City of Los Angeles

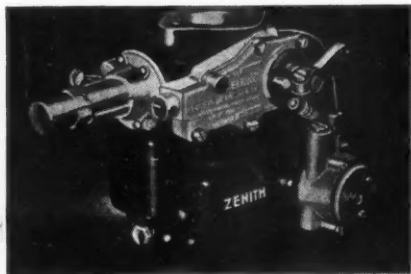


# SHOWCASE

## *of New Products*

### Leibing Motor Degasser

A new device for the control of exhaust gases from gasoline burning engines has been introduced by Leibing Automotive Devices, Inc. Known as the Leibing Degasser it is available for use on all makes of trucks and buses. Almost total elimination of both carbon monoxide and carbon dioxide gases in the exhaust are claimed. Aldehyde concentrations (those offensive smelling fumes) are said to be approxi-



mately 185 times less with the degasser than without, and gas mileage showed savings from 12 to 25 per cent.

The degasser mechanism consists of a flexible diaphragm which is actuated by the increased vacuum resulting from motor deceleration. This in turn shuts off the excess flow of gasoline. Less crankcase dilution is also claimed.

The device cannot be installed as a separate carburetor attachment but is available at the present time as a built-in unit on both updraft and downdraft Zenith commercial carburetors and on certain Stromberg models. Address Leibing Automotive Devices, Inc., 5725 Mt. Elliott Ave., Detroit, Mich., for full details.

### Snap-on Torqometer

The new Torqometers made by Snap-on Tools Corp. have been designed with long, slender bodies which work freely in rather close quarters and are fitted with pre-set type, easy-to-read dials. These tools, with a pre-determined leverage, measure the deflection of a solid steel bar at any pressure and indicate this deflection on the dial. They are designed to give readings of the greatest accuracy. The cast aluminum alloy housing incloses all the working parts, protects the beam from nicks, sur-

face scratches or other damage, and keeps the entire mechanism sealed against grease and grit. The pressure ranges of these six instruments are as follows: Zero to 80 ft. lb.; zero to 150 ft. lb.; zero to 350 ft. lb.; zero to 600 ft. lb.; zero to 1000 ft. lb.; zero to 1500 ft. lb. For further information write Snap-on Tools Corp., Kenosha, Wis.

### New Gatke Brake Block

An improved brake block said to have remarkable qualities for dissipating heat has been announced by Gatke. According to the manufacturer, it has a more constant holding power at all service temperatures and a greater resistance to wear than any lining material ever tested in the Gatke laboratories. Available in custom-built sets, including liners of the correct friction value for balanced action on all standard type trucks, tractors, trailers, and buses. For details, write Gatke Corp., 228 N. LaSalle St., Chicago.

### Inner Tube Seals Punctures

A passenger car inner tube, capable of actually sealing punctures on moving wheels without loss of tire pressure, is announced by Goodrich. The new tube reduces blow-out danger, at the same time giving protection against flat tires caused by nails, screws and glass, closing such breaks instantly. For details, address the B. F. Goodrich Co., Akron, Ohio.

### Do-Ray Directional Signal

An economical single unit passenger car directional signal has been announced by Do-Ray Lamp Co., 1458 S. Michigan Ave., Chicago. Universal mounting bracket permits easy installation without drilling. Body of brass, chrome plated. A fingertip switch is provided for the steering post. No. 50 (with one lamp) lists at \$5.00 complete; No. 51 with two lamps for front and rear installation, \$8.00. Full details from the manufacturer.



### Jack Has Flashlight

No longer is it necessary to feel around in the dark with the jack saddle in an effort to get it placed under the axle for Blackhawk service jacks of 2, 3 and 4-ton capacity are now equipped with a spotlight so you can see the position of the jack. A press of a button in the handle grip

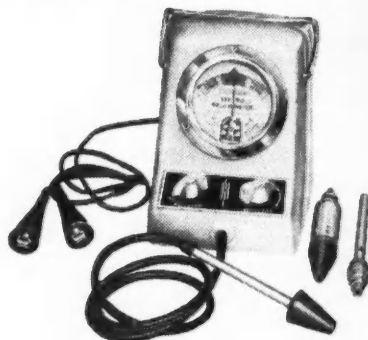


shoots a beam of light to the axle.

In addition, the 1939 Blackhawk line includes a positive handle lock. The release valve is equipped with a built-in safety tumbler lock so that with a turn of a removable key, all controls are disengaged. Blackhawk Mfg. Co., 5325 W. Rogers St., Milwaukee, Wis.

### Valve Trouble Shooter

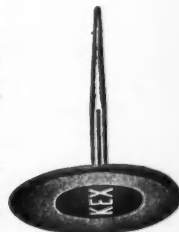
Black & Decker Mfg. Co., Towson, Md., have a new piece of equipment for testing valves called the Lectro Valv-O-Meter. It is operated by electricity and compressed



air. The purpose of the instrument is to determine the condition of the valves and if they need grinding without disassembling the engine.

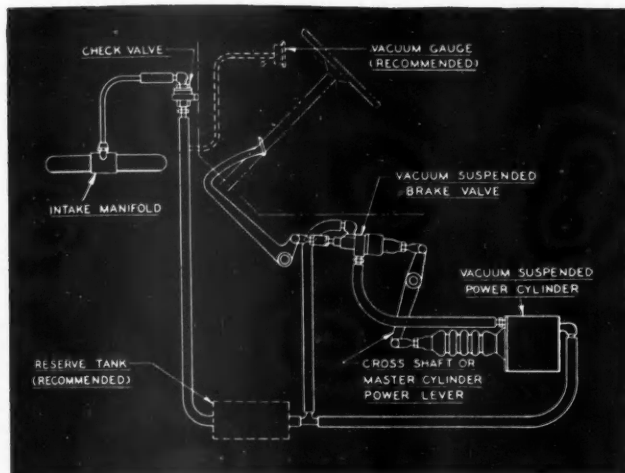
### Kex Tire Plugs

KEX nail hole tire plugs are used to seal holes in casings too small to vulcanize and to protect the casing structure after puncture. The plug stem is enclosed in a metal quill tapered to a needle point and compressed to about one half its normal size for easy insertion. When the quill is removed from the stem after the plug is installed the stem expands to normal size. This action makes a water-tight seal through the hole in the casing and the plug

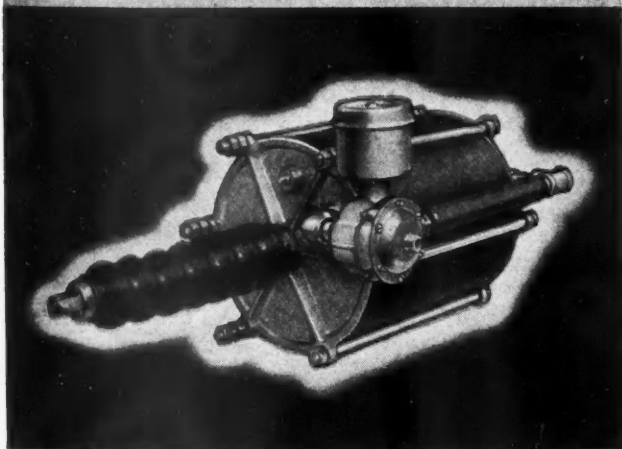


(TURN TO PAGE 60, PLEASE)

# Bendix B-K puts power on your brakes, instead of in them!



Bendix B-K Controlled Vacuum Power Braking, pioneer in its field, is backed by fifteen years of world-wide experience. As a result, Bendix B-K units are far in advance in engineering principles, providing finest gradation of brake control and perfect balanced brake action. The Reactionary feature of the Bendix B-K system is unique in that it constantly maintains desirable "pedal-feel," and avoids sudden, lock-wheel stops. Bendix design protects against external injury to mechanism through mud, water and road impacts.



Naturally, any truck or bus manufacturer will disapprove of altering the brake layout he has carefully designed and painstakingly proved. He urgently recommends that it be left intact—undisturbed—and that is precisely why Bendix B-K Vacuum Power Braking is so popular!

In the Bendix System, power is applied *on* the brakes—not *in* them. The original, factory-engineered brake layout, whether it be Mechanical or Hydraulic, Bendix or some other make, is left intact.

Bendix B-K consumes *no* engine power (except a very slight amount with Diesel power). It vastly multiplies the driver's muscle-effort, while constantly responsive to his slightest variations in pedal pressure. It meets *all* state laws for single vehicle or trailer operation.

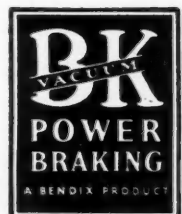
Nation-wide Bendix Service is at your driver's disposal, and the cost of perfect maintenance is very, very low. Write—

**BENDIX PRODUCTS DIVISION**  
OF BENDIX AVIATION CORPORATION  
401 Bendix Drive, South Bend, Ind.

# BENDIX

*Controlled Vacuum*

# POWER BRAKING





## F W D OFFERS NEW MODEL HG

**A** NEW Model HG, equipped with underbody blade and incorporating many refinements and improvements, was recently announced by The Four Wheel Drive Auto Company, Clintonville, Wisconsin, and Kitchener, Ontario, Canada.

Model HG was developed primarily for underbody blade service, but also serves every purpose as a truck and is ideally suited for snow removal, with either a one-way or "V" type plow.

With a 154 in. (standard) wheel base, the new Model HG has a chassis weight of 6800 lb. with cab. The



The new FWD Model HG equipped with underbody blade. Its clearance is 23 in.

gross rating is 16,000 lb. The chassis may be equipped with either an 8 ft. or 10 ft. body.

Increased power, better performance and greater economy are achieved by improvements incorporated in the 91 hp. engine, having a

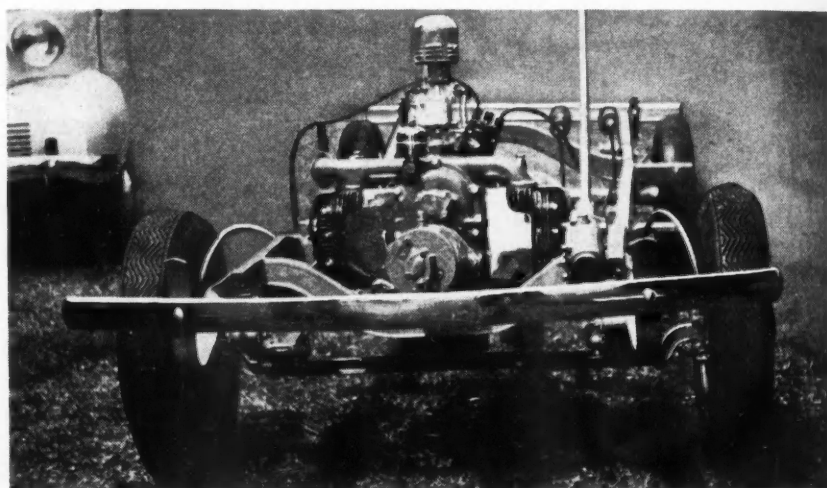
piston displacement of 381 cu. in., a bore and stroke of 4 1/8 in. x 4 3/4 in., and a torque rating of 270 ft. lb.

Single plate 14-in. clutch, five speed transmission and patented FWD transfer case are features. Standard gear ratio is 7.85 to 1.

## SMALL CROSLLEY CARRIES 1/4-TON



Top: The convertible Coupe converts to 1/4-ton pick-up. Right: Front end of chassis



**RADIOMAN** Powell Crosley's new automobile may offer interesting possibilities in the fleet field, for one of the two models easily converts to a 1/4-ton pickup. As yet unknown is its production schedule.

Based on advanced models, the car has an 80 in. wheelbase and a 40-in. tread. Its 2-cylinder, 4-cycle, air-cooled engine has a displacement of 38.87 cu. in. It is built especially for Crosley by Waukesha. The Haw-

ley brakes give 350 deg. of lining contact.

Top speed of the new car is said to be 50 m.p.h. and the weight is 925 lb. The convertible coupe delivers in Richmond, Ind., for \$325.

### New Truck Registrations by Makes by Months\*

	Auto-car	Brock-way	Chevrolet	Diamond T	Dodge	Federal	Ford	G.M.C.	Hudson	Inter-nat'l	Mack	Ply-mouth	Reo	Sterling	Stewart	Stude-baker	White Indiana	Willis	Misc.	Total
January.....1939	143	127	13,615	378	4,002	85	10,188	2,384	47	4,709	482	507	168	25	47	169	348	88	203	37,716
January.....1938	130	64	10,338	357	3,145	118	9,304	1,777	103	4,581	257	691	217	16	27	161	301	179	229	31,995
February.....1939	134	98	12,007	308	3,821	79	9,224	2,218	44	4,284	398	510	159	29	11	143	275	97	263	34,192
February.....1938	96	57	9,174	350	2,677	110	7,863	1,424	81	3,847	223	587	184	9	20	147	219	142	241	27,551
March.....1939	150	168	15,933	392	4,736	116	11,541	2,651	39	5,315	473	853	172	17	5	190	387	144	347	43,009
March.....1938	110	86	12,151	392	3,640	131	9,874	1,941	78	5,216	356	782	286	17	32	161	384	174	300	36,111
Three Months.....1939	427	393	41,555	1,078	12,559	280	30,953	7,253	130	14,308	1,353	1,870	499	71	63	502	990	329	813	115,426
Three Months.....1938	336	207	31,663	1,099	9,462	359	27,041	5,142	262	13,644	836	2,060	687	42	79	469	1,004	495	770	95,657
% Change....3 Mos.	+27	+30	+31	-2	+33	-22	+14	+41	-50	+5	+62	-9	-27	+69	-20	+7	-1	-34	+6	+21

\* Complete except for Tennessee for March.

**Exide**  
HEAVY DUTY  
BATTERIES  
for Commercial Service

A few of the Exide-equipped delivery units of the Virginia Dairy Company, Richmond, Va.



## The Exides in this fleet see 2450 miles of delivery service per day...

**D**OOR-TO-DOOR delivery is one of the toughest types of service, requiring batteries of utmost dependability. The Virginia Dairy Company of Richmond, Va., operates a fleet of 49 units, each of which averages about 50 miles per day.

The entire fleet is Exide-equipped. This operator has used Exides for several years, and is convinced of their dependability.

Exide Batteries, which stay on the job and out of

trouble, always mean greater economy. You experience fewer tie-ups and delays. Battery replacements are reduced, and maintenance expense is cut down. You are sure of lower battery cost per mile.



The Exide line is complete, with Heavy Duty Exides for all commercial vehicles, as well as Exides for cranking Diesel-powered equipment. Why not standardize on Exide and cut costs? See your Exide Wholesaler today.

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia  
*The World's Largest Manufacturers of Storage Batteries for Every Purpose*  
Exide Batteries of Canada, Limited, Toronto



# NEWSCAST

*Bart Rawson* Commentator

## Wheeler-Truman Developments

Once again Capitol Hill figures in the news, for fleetmen everywhere are keeping an anxious eye on the fate of the Wheeler-Truman transportation bill (S. 2009) which, on May 18, was introduced to the Senate by the Senate Committee on Interstate Commerce which recommended its passage.

Briefly the bill seeks to codify and incorporate under a single statute the present Interstate Commerce Act, Part I (railroads) and Part II (Motor Carrier Act, 1935). It also brings water carriers and pipe line companies under regulation of the ICC but leaves air transportation still under the Civil Aeronautics Authority. As revamped by the committee, however, the bill differs materially from the original.

In a 39-printed-page report the committee explained its reasons for favoring the bill, based largely on the fairness of putting competing transportation agencies under a common starting point of regulation. "At present there is a plethora of transportation facilities," says the report significantly, "and under these circumstances it becomes apparent that some tribunal must be empowered with the authority to determine into what *particular niche each form of transportation is best fitted, and to discourage other forms of transportation from entering therein.*" The minority opinion, printed separately, pointed out the increased cost necessitated by regulation and asks why the consumer should be called upon to bear this additional cost.

Among the changes is the stipulation that the "Commodities clause" applies only to the railroads and that the "Long-and-short-haul" clause be broadened to include all carriers. The amendments include one which *may* force the railroads to pool their less-than-carload shipments and which *might* force independent freight forwarders out of business. It was inserted by the committee at the last moment and stipulates that the ICC may, at its own discretion and in the interest of more efficient handling, require the carriers to form such a pool for forwarding freight through a common agency and such agency would then become subject to the provision of the act. Observers who had advocated regulation of freight forwarders commented that this provision might rather annihilate rather than regulate them.

## ICC Figures Again

A month never goes by but that the ICC makes news in the trucking world. This time they have handed down a self-ruled decision that their jurisdiction over interstate carriers applies only to employees whose activities affect the *safety of operation* of motor vehicles. The decision applies to common, contract and private carriers alike, and automatically places all employees who do not meet this qualification under the jurisdiction of the Fair Labor Standards Act. It is understood that the American Trucking Associations, Inc., will file suit shortly in the Federal Courts under the Declaratory Judgment Act to have the courts pass on this question.

## ... and Again

Apparently pointed at relieving doubt in the minds of operators with respect to certain speed regulating devices now on the market, the Commission has ruled that Rule 2 of Section A of the code covering safety equipment be amended so that "the color blue or purple may be used on the front and rear of any motor vehicle in a device to indicate the speed at which the motor vehicle is moving."

## Production Still Way Ahead

Again we had to break into the form at the last minute to give you truck production figures (U. S. and Canada) for April. The total was 68,063 units, a drop of 12 per cent from the March figure of 77,097, but 42 per cent, nevertheless, above April a year ago when the output was 48,018. Total for the first four months, 268,916; last year 210,000; gain 28 per cent.



Detroit's ash and rubbish collectors, organized as the "Knights of the Iron Horse," recently purchased these 115 Ford trucks. Seventy-five are Truckstell-equipped c.o.e. units; 40 are conventional 85 hp. models.

## Users Pay for Highways

Contributing an interesting angle to the old problem of whether or not motor vehicles actually do pay their fair share of the highway costs, comes the report of an investigation into the Illinois state highway system. The study, undertaken at the request of the Illinois Highway Users Conference, was conducted by Grover C. Dillman, president, Michigan College of Mining and Technology; D. Philip Locklin, associate professor of economics, University of Illinois; G. Lloyd Wilson, professor of transportation and public utilities, University of Pennsylvania, and John S. Worley, professor of transportation engineering, University of Michigan. The report is long but these brief points are important:

1. The motor vehicle owners not only pay their share of highway costs, but much more. The committee found that in figuring the annual highway costs there was a charge for amortization of present highways as well as an item for depreciation. Thus, in effect, the users are paying for highways twice, for they are not only paying in full for the present highways, but also accumulating a reserve to build new highways when present ones have worn out.

2. The committee pointed out that because of such reasons as mail routes, national defense, public health and education, agriculture, commerce, etc., the state should assume a part of the highway cost out of the general fund, directly refuting the theory that the state should be reimbursed for taxes lost on property occupied by the highways which it classed as ridiculous. The committee cited previous studies that fixed the users' share of highway costs at from 82 to 90 per cent. Based on 1936 totals of highway cost the users' share was \$38,318,591. Yet highway taxes that year amounted to \$53,361,907, leaving a substantial balance for *future* highways or other uses.

3. On the question of allocating a greater share of highway costs to the heavier vehicles, the report said that its studies proved that roads of a width and thickness sufficient to support heaviest traffic would be built even if they were to be used solely by passenger cars. Practically all the states favored a width greater than the generally-accepted minimum for light-car traffic.

## Anti-Diversionists

As a hedge against "other uses," however, five state legislatures have now ap-

(TURN TO PAGE 42, PLEASE)





## What's bad for cats but good for oil men?

**"Curiosity," the old saw has it, "killed the cat!"**

But it is the *lack* of curiosity—and the research it fathers—that would be fatal to an oil company. For nine-tenths of the petroleum industry's progress... in prospecting, new products, and refining technique... is won in the laboratory.

Gulf's attitude toward research speaks for the progressiveness of this company. To its two great scientific institutions

—the Research Laboratory at Harmarville near Pittsburgh and the Refinery Technological Laboratory at Philadelphia—Gulf awards a generous budget.

**The object:** To answer such questions as these...

"What significance have certain recurring rock formations with respect to oil deposits? Can a more effective insecticide be made from refinery gases? Do automobile engines operate better in damp weather? If so... why?"

With the aid of geological, chemical, and metallurgical research, Gulf scientists uncover each year new processes, new principles, and new products.

Nobody recognizes more than Gulf the fact that, without research, a modern industry stagmates. And few are using research to greater advantage.



GULF OIL CORPORATION • GULF REFINING COMPANY • GULF BUILDING • PITTSBURGH, PA.

## NEWSCAST

(CONTINUED FROM PAGE 40)

proved anti-diversion constitutional amendments according to reports received by the National Highway Users Conference. These states are Idaho, Iowa, Nevada, South Dakota and Wisconsin. In most of these states the question will be submitted to voters at the next general election. North Dakota re-enacted its anti-diversion law.

### Illinois Week-end Truck Ban

Again from Illinois comes word that Senate bill, S. 155, providing week-end and

holiday ban to truck operations was assigned to the senate *Committee on Railroads* with the report "Do Pass," without opponents being heard. Twice postponed, a hearing was scheduled for the latter part of May.

### Arc Welding Encyclopedia

Remember the big prize contest that Lincoln Arc Welding Foundation (a Lincoln Electric Co. enterprise) staged a year or so ago? As could well be expected in a \$200,000 undertaking, some of the entries made mighty worthwhile reading, and the best (109 of them) have been incorporated in a new 1400-page book just pub-

lished by the Foundation. It seems there are 89 pages and 47 illustrations devoted to automotive welding alone. \$1.50 per copy in the U. S. A. Address Lincoln Arc Welding Foundation, P. O. Box 5728, Cleveland, Ohio.

(More News Begins on Page 58)

## AFTER HOURS

(CONTINUED FROM PAGE 19)

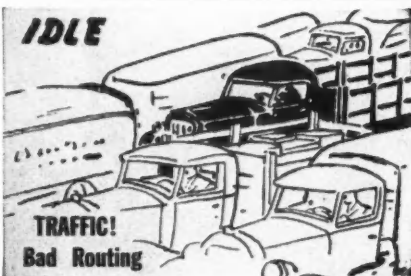
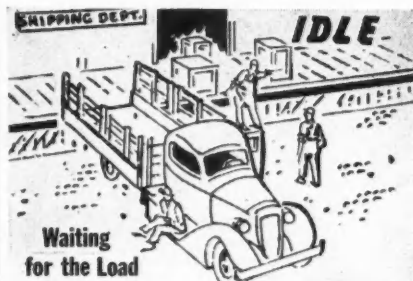
of this patriotic preference on branch and dealer sales organizations that must depend upon deliveries of private orders for subsistence; the disruptive effect of compulsory standardization on assembly lines; the interference with normal engineering improvements; the problem of readjustment after the war has ended. In short, all of the evil effects of bureaucratic control over an industry as dynamic as any in the world, the spice of whose life is in meeting the transportation requirements of private industry, and the mother of whose inventiveness is competition.

Definitely the truck manufacturing industry has more to lose than to gain by war.

What can the trucking industry expect in the event the United States goes to war? History provides the answer. During the last war the government took over the railroads. It didn't do the railroads a bit of good. In the next war, the government will not merely take over the railroads but the railroads' competitors to boot. The trucking industry will not take orders from private management; it will get its orders from Washington. The young and middle-aged truck drivers and helpers will be drafted and put to driving army trucks. The trucking lines will have to find, or the government will find for them, a new crop of drivers and helpers. The chances are they will not be fitted for their tasks. Efficiency will fall off, vehicles will be abused, equipment will become undependable, management will hesitate to make replacements, and the financial losses incident to government control will have to be met by the private owner. He'll find out the real extent of those losses when the war ends and control is returned to him.

Decidedly the trucking industry and the truck manufacturing industry (TURN TO PAGE 44, PLEASE)

**DELAYS!  
DELAYS!  
DELAYS!**



## BUT DON'T *Always* BLAME THE DRIVER

● Truck delays are not always the driver's fault. Perhaps the office is responsible. And *that* discovery leads the way to truly enormous savings.

Here's a truck waiting for its load for 2 hours, at a cost of \$2 or \$3 an hour! Here's a truck with a short afternoon route, getting in at 3:30 and nothing more to do till closing time.

### COSTLY DELAYS!

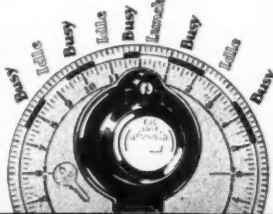
Here's a truck that's up against a hold-up at the freight station, which could be corrected; here's a truck

bucking rush hour traffic unnecessarily; here's a truck that needs a helper; here's a truck that's overworked, causing costly overtime!

### Time, time, time!

It's all a problem in TIME—and of course the *Servis Recorder* gives you all this information, on its chart, at a glance. It gives you the clue, it points the way to a proper arrangement of your whole truck system, where the driver is only a small part of your problem. Write for free booklet: "Ten Ways of Getting More Work Out of Motor Trucks."

The SERVICE RECORDER Co.  
1422 Euclid Ave., Cleveland, O.  
Branches in Principal Cities



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*The Good Driver's Best Friend*

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COMMERCIAL CAR JOURNAL  
JUNE, 1939

# Around the World in 60 days!



**THERE NEVER HAS BEEN AN INSTANT SUCCESS LIKE IT IN THE TRUCK BUSINESS!** Since the first White Horse rolled off the production line 60 days ago, orders and inquiries have poured in from all 48 states, Canada, England, Mexico, Cuba, Brazil, Argentina, Holland, Switzerland, Dutch East Indies and a score of other countries around the world.

THE  
**White Horse**

FROM THE START of production 60 days ago, the new White Horse line has operated at capacity to meet the amazing demand for this entirely new and basically better home-to-home delivery truck.

THE WHITE HORSE is as *different as profit and loss* for all types of city route delivery service...for bakeries, dairies, laundries, dry cleaners, groceries, department stores and other progressive merchants everywhere.

Only a *basically better* design would get the spontaneous acceptance given THE WHITE HORSE from the start.

What's different about it? Everything! Its economical air-cooled, aviation type engine. Its new driving ease and safety features. Its fully insulated,

all-welded, fume-proof body, cradled on live rubber and coil springs for extra protection of fragile loads.

THE WHITE HORSE comes in two wheelbases with proper body sizes for all types of house-to-house delivery service. The 99" wheelbase unit, complete with body, is priced at \$1260, at Cleveland, plus taxes.

Get in touch with your local White Branch or Dealer today for a demonstration.

THE WHITE MOTOR COMPANY  
Cleveland

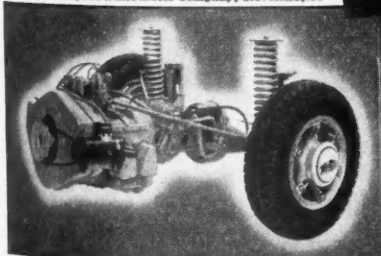
**White**  
TRUCKS

2,456 CAR DEALERS HAVE WIRED, PHONED, WRITTEN for details of the WHITE HORSE franchise!



The White Factory has been flooded with inquiries and requests for open White Horse territory because car dealers recognize The White Horse's unusual sales appeal. Here Vice Pres. J. N. Bauman is shown with a few covering his desk. • Your territory may still be available—mail coupon below for full information.

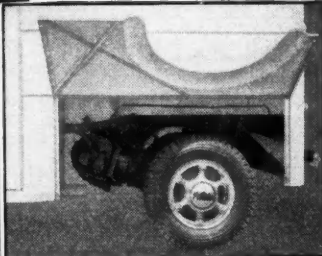
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**AVIATION TYPE**, air-cooled, 4-cylinder engine, mounted integrally with the rear axle, clutch and transmission. Entire power unit easily removable and interchangeable.



**PERFECTLY FLAT FLOOR**, from side to side, no obstructions. Low (11½-inch) step.



**"EASY AS RAISING THE HOOD"** of your passenger car. Fender skirts lift up on either side providing instant accessibility to the power unit.

THE WHITE MOTOR COMPANY, Cleveland, Ohio.  
Gentlemen: Please send me complete information about the new WHITE HORSE.

Signed.....

Firm Name.....

Street Address.....

City.....

State.....

☐ Operator

☐ Dealer

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COMMERCIAL CAR JOURNAL  
JUNE, 1939

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(CONTINUED FROM PAGE 42)  
do not want the United States to engage in a European war. They have too much to lose by the virtual dictatorship which the government—no matter what party is in power at the time—will invoke.

Both industries have much more to gain with nations at peace. There are wars to be fought that are more important than bloody wars in which man kills man and is killed in return. There are the "bloodless wars" to bring other countries nearer the

American standard of living, to improve the American standard, to eliminate waste in distribution practices, to help the laundry, the dairy, the department store and numerous other vocations deliver their goods more economically to the public.

All these and many other similar "bloodless wars" can be successfully fought only in an atmosphere of peace. In all of them the motor truck is destined to play a vital part. And in playing that part, those who make and those who operate trucks stand

to gain much more than they could possibly get out of a bloody war.

#### Will Examiner Snow Find a Need for Regulating Private Trucks?

IF the well-known Dr. Gallup were to poll private truck owners who attended the Interstate Commerce Commission hearings intended to determine if there is need for Federal safety regulation of private trucks in interstate commerce, he would find that Examiner R. W. Snow is indeed a very unpopular person.

The basis for this unpopularity—of which Mr. Snow has probably been made aware—is the belief of private truck owners that by his conduct on the bench the Examiner revealed a prejudice against privately-operated trucks. They arrived at their conviction simply by considering the manner and method in which Mr. Snow questioned witnesses and by his general remarks and his rulings, and by comparing them with their own feelings.

Of course, in fairness to Mr. Snow, this does not prove the existence of a prejudice. In fact, his conduct, no matter what suspicions it aroused, is defensible on the ground that it was a necessary device in order to try to develop a hearing record that would be something more than a blanket opposition by private truck owners to Federal regulation. We are not familiar with the rules by which I.C.C. examiners conduct themselves, but if the term "examiner" is truly descriptive of their function, it would be difficult to single out a single statement or action by Mr. Snow that could be criticized as not in line with his duty.

If Examiner Snow actually entertains a prejudice, private truck owners must look for it in the report which he will shortly make to the Interstate Commerce Commission.

In the Federal Motor Carrier Act, Congress said "It shall be the duty of the Commission to establish for private carriers of property by motor vehicle, *if need therefor is found*, (italics ours) reasonable requirements to promote safety of operation, and to that end prescribe qualifications and maximum hours of service of employees, and standards of equipment."

Private truck owners may be justified.  
(TURN TO PAGE 46, PLEASE)

**For STEADY SERVICE Specify HANSEN**

**RUGGED** construction thruout—unusually simple design—durable materials—careful workmanship—combine to make Hansen Hardware give *steady service*.

Lug-leverage action of the No. 70-D Lock shown compresses doors tight shut. Square-Corner Hinge illustrated permits swinging doors wide open. One-Piece Lock and Straight-Lift Regulator pictured are examples of Hansen simplicity.

Whatever your body-building requirements, there's a Hansen product to meet your hardware needs.

**Ask for Catalog**

No. 12-S Square-Corner Hinge
No. 60 Extension Lock
No. 70-D Refrigerator Lock
No. 85 Window Regulator

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HARDWARE for Commercial Bodies

# The New **FRUEHAUF** **AEROVAN** FROM THE OPERATOR'S POINT OF VIEW



"THIS new equipment now has had several month's service. It has done such an excellent job that I am planning on replacing all old type Trailers with this new type Semi. I have found that I can haul 25,000 lbs. with my light tractors and over 23,000 lbs. with my heavy tractors—an increase in payload of up to 4,000 lbs., without conflicting with weight laws."  
OTTO ABSEIER TRUCKING CO.  
Indianapolis

### WEIGHT SAVING—1500 LBS.

Rate per Cwt.	TABLE OF EXTRA EARNINGS				
	Per Trip	50 Trips	100 Trips	200 Trips	250 Trips
\$0.16	\$2.40	\$120	\$240	\$ 480	\$ 600
.24	3.60	180	360	720	900
.32	4.80	240	480	960	1200
.40	6.00	300	600	1200	1500
.48	7.20	360	720	1440	1800
.56	8.40	420	840	1680	2100
.64	9.60	480	960	1920	2400

## The EXTRA PROFITS P I C T U R E

THE chart at left shows the extra earnings you make with the new AEROVAN, based on its minimum added payload capacity of 1500 pounds. You can double—even triple—these figures when the AEROVAN is compared with many Trailers now on the road! Ask the Fruehauf man to show you the savings as applied to your exact operation. He has them ready for you.

### COST-CUTTER NUMBER TWO DUAL DIFFERENTIAL WHEELS

IF you're looking for the ultimate in economy, don't neglect cost-cutter number two in the Fruehauf line for '39, Dual Differential Wheels • They cut gas and oil costs up to 20%. Double tire life. Give freer rolling, permitting one gear higher in hilly country. Cut running time on the straightaway • As with the AEROVAN, your nearest Fruehauf representative has all the facts.

FRUEHAUF TRAILER COMPANY, DETROIT, MICHIGAN  
World's Oldest and Largest Manufacturers of Truck-Trailers • 10940 Harper Avenue • Sales and Service in Principal Cities

**FRUEHAUF TRAILERS**



"Engineered  
Transportation"  
REG. U. S. PAT. OFF.

(CONTINUED FROM PAGE 44)

fied in their fear that Examiner Snow will take a rather broad view of what constitutes evidence of need. Mr. Snow should have a difficult time evaluating the testimony in the record as an evidence of need. The private carriers who testified were almost unanimous in their opposition to regulation. The proponents of regulation certainly did not prove a need. Their testimony merely proved their desire for regulation of private trucks.

Apparently an I.C.C. Examiner is expected to base his recommendation solely upon the testimony submitted at hearings. Such was hardly the case when hearings were held to determine what hours of service should be prescribed for common and contract carriers in interstate commerce. There was no testimony then to prove that long hours of service caused accidents. There was ample testimony proving that accident frequency was greatest during the first few hours a driver was on duty. Yet Examiner

Snow recommended a maximum week of 60 hours and doubtless felt he was liberal in doing so. The Commission accepted the argument that "a beginning in the regulation of maximum hours of service of drivers should be made at this time." And in announcing the regulations the Commission made mention of its "well-established practice of deciding cases solely upon the evidence submitted at the hearings," but accepted this choice bit of reasoning by the examiner: "It is clear, however, that only carriers who did have good accident records appeared and testified. Therefore, the fact that few accidents were shown to have occurred in the operations of carriers whose employees worked such long hours (as much as 16 per day) cannot be given too much weight."

Examiner Snow will have to minimize similarly the testimony adduced in the private carrier hearings if he is to prove there is a need for private carrier regulation. He will have to prefer his own logic to the testimony of witnesses, a preference which he displayed in his common and contract carrier recommendations. He will have to take recourse in the argument that if there is a safety value in regulating common and contract carrier operations, the cause of safety will certainly be advanced by regulating an even greater number of private trucks. He will have to advance the argument that it would be unfair to regulate one type of carrier and not another.

In short, the fear of private truck owners is that Examiner Snow will be concerned not with deciding whether there is need of regulation on the basis of the testimony, but with determining what he shall construe as representing a need.

In which case they will feel their suspicions of prejudice were justified.

## How Much of Your Truck Tire's Usefulness Does HEAT Consume?

Have you figured out how much *heat wear* in your tires costs you?

You needn't start guessing all the things you want and need to know about internal heat generation which weakens fabric and causes road delays from tire failures. . . That makes operating costs go up and profits down. . . LEE engineers have found out for you. They tested all makes of truck tires. The

results are set down in an informative cost-reducing article by A. H. Nellen. For your FREE copy of "Comparative HEAT Generation In Truck Tire Treads and Carcasses" write today to the Lee Tire & Rubber Co., Dept. A., Conshohocken, Pa.



**COMPARATIVE HEAT GENERATION**  
In Truck Tire Treads and Carcasses  
By A. H. Nellen  
Director, Development Department,  
Lee Tire & Rubber Company

**LEE** Conshohocken Tires

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### QUIZ ANSWERS (See page 18)

1. W type
2. I type
3. S type
4. The letter M
5. The letter F
6. Alfred P.
7. T series
8. A belt with trapezoid cross section
9. 1937
10. Bragg-Kliesrath

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COMMERCIAL CAR JOURNAL  
JUNE, 1939





MAKE AND MODEL	GENERAL (See Keynote)			TIRE SIZES		ENGINE DETAILS										TRANSMISSION		REAR AXLE		FRONT AXLE		BRAKES					C-A Dimension (Std. W. B.)	FRAME					
	Type	Tonnage Rating	Chassis Price	Standard Wheelbase	Max. Wt. W.B.	Gross Vehicle Weight	Chassis Wt. (Striped)	D-wheel rear	D-wheel front	No. of Cylinders	Stroke	Displacement	Comp. Ratio	Torque lb. ft.	Max. Brake H.P. at R.P.M.	Main Bearings	Governor Standard	Make and Model	Forward Sp'ds	Make and Model	Gear and Type	Drive & Torque	Gear Ratio	Range in High	Make and Model	Location			Type	Lining	Drum Area	Drum Material	Hand Location
Autocar (1) A	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
1	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
2	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
3	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
4	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
5	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
6	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
7	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
8	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
9	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
10	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
11	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
12	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
13	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
14	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
15	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
16	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
17	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
18	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
19	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
20	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
21	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
22	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
23	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
24	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
25	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
26	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
27	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
28	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
29	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
30	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
31	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
32	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
33	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
34	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
35	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
36	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
37	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X	Clia 355F	4	Tim 54412	4	Tim 54410	2F	H	6.49-7.89	Tim 31007	LAIHV	308	470	c	TX	62	82 3/4 x 14	
38	1250	139	179	13500	4790	6.50/20	8.25/20	Her JXC	6-3 1/4	4 1/4	263	5.8	184	73-2500	7-1 1/2 x 10	X																	







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135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000
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† Rear 32 x 6. ‡ Denotes New Model or Change in Specifications.



Line Number	MAKE AND MODEL	GENERAL (See Keynote)			TIRE SIZES		ENGINE DETAILS						TRANS-MISSION		REAR AXLE		FRONT AXLE		BRAKES				C-A Dimensions (Std. W.B.)	FRAME								
		Tonnage Rating	Chassis Price	Standard Wheelbase	Max. W.B.	Gross Vehicle Weight Limit	Chassis Wt.	(Striped)	Standard Rear	Dual rear Single rear	No. of Cylinders	Stroke	Displacement	Comp. Ratio	Torque lb.-ft.	H.P. at R.P.M.	Main Bearings Diameter, Length	Governor Standard	Make and Model	Gear and Type	Drive & Torque	Range in High			Make and Model	Location	Type	Open'n	Area	Drum	Material	Hand Location
1	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
2	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
3	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
4	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
5	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
6	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
7	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
8	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
9	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
10	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
11	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
12	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
13	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
14	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
15	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
16	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
17	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
18	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
19	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
20	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
21	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
22	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
23	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
24	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
25	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
26	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
27	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
28	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
29	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
30	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
31	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
32	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
33	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
34	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
35	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
36	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
37	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
38	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
39	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
40	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
41	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV	384	794	a	TX	XLT	96	96
42	La France Rempublic	3-5	3070	175	215	20000	7850	8.25	20D	9.75/20	Wau GBZ	6-4x14	320	5	210	86-3000	7-2x10	Y	Ful RA23	H	533000H	SF	R 57-7.80	Tim 350000H	L4HV							





Line Number	MAKE AND MODEL	GENERAL (See Keynote)				TIRE SIZES				ENGINE DETAILS				TRANSMISSION		REAR AXLE		FRONT AXLE	BRAKES				FRAME							
		Chassis Price	Standard Wheelbase	Gross Weight	Chassis Wt.	Standard Front and Rear	Dual rear	Maximum Tire Size	Furnished	No. of Cylinders	Displacement	Comp. Ratio	Torque lb.-ft.	H.P. at R.P.M.	Main Bearings	Governor Standard	Make and Model	Gear and Type	Drive & Torque	Range in High	Make and Model	Location	Line	Area	Drum	Drum Material	Hand Location	C&A Dimension	Side Rail Dimensions	Type
1	Indiana	1324	131	100	100	7.50/20	7.50/20	7.50/20	Her JXC	6-34x4	282	5.4	176	73-2800	7-24x10H	Y BL 2341	4 Tim 5210	4S	H 5.5	14-5.9	W 303	LAIHV	412	260	412	G	TD	46 3/4	7 1/2x3 1/2x2 1/2	T
2	Kenworth	539	6118	134	146	24000	10180	9.00/20	Bud K428	6-4 1/2x4 1/2	428	5.3	302	108-2400	7-3x11 1/2	Y Fu 5A62	5 Wis 72300	2F	H 7.7	17-8.40	W 2307	LAIHV	458	785	458	PD	72	7 1/2x3 1/2x2 1/2	T	
3	Marmon-Herr	541	783	134	146	27700	10310	9.75/20	Bud K428	6-4 1/2x4 1/2	428	5.3	302	108-2400	7-3x11 1/2	Y Fu 5A62	5 Wis 72300	2F	H 7.7	17-8.40	W 2307	LAIHV	458	785	458	PD	72	7 1/2x3 1/2x2 1/2	T	
4	Marmon-Herr	542	8113	134	146	35000	10935	10.50/24	Bud LO325	6-4 1/2x4 1/2	525	5.3	385	132-2200	7-3x11 1/2	Y Fu 5A62	5 Wis 72300	2F	H 7.7	17-8.40	W 2307	LAIHV	458	785	458	PD	72	7 1/2x3 1/2x2 1/2	T	
5	Marmon-Herr	543	1448	113	113	9.00/15S	9.00/15S	9.00/15S	Ford V8	8-30x34	221	6.1	150	85-3800	3-2 1/2x5 1/2	Ford	4 Ford	8F	H 6.6	14-5.9	W 303	FO4HV	162	264	162	TX	60	7 1/2x3 1/2x2 1/2	T	
6	Marmon-Herr	544	1583	123	123	7.50/17S	7.50/17S	7.50/17S	Ford V8	8-30x34	221	6.1	150	85-3800	3-2 1/2x5 1/2	Ford	4 Ford	8F	H 6.6	14-5.9	W 303	FO4HV	162	264	162	TX	60	7 1/2x3 1/2x2 1/2	T	
7	Marmon-Herr	545	1583	123	123	7.50/17S	7.50/17S	7.50/17S	Ford V8	8-30x34	221	6.1	150	85-3800	3-2 1/2x5 1/2	Ford	4 Ford	8F	H 6.6	14-5.9	W 303	FO4HV	162	264	162	TX	60	7 1/2x3 1/2x2 1/2	T	
8	Marmon-Herr	546	1583	123	123	7.50/17S	7.50/17S	7.50/17S	Ford V8	8-30x34	221	6.1	150	85-3800	3-2 1/2x5 1/2	Ford	4 Ford	8F	H 6.6	14-5.9	W 303	FO4HV	162	264	162	TX	60	7 1/2x3 1/2x2 1/2	T	
9	Marmon-Herr	547	1583	123	123	7.50/17S	7.50/17S	7.50/17S	Ford V8	8-30x34	221	6.1	150	85-3800	3-2 1/2x5 1/2	Ford	4 Ford	8F	H 6.6	14-5.9	W 303	FO4HV	162	264	162	TX	60	7 1/2x3 1/2x2 1/2	T	
10	Marmon-Herr	548	1583	123	123	7.50/17S	7.50/17S	7.50/17S	Ford V8	8-30x34	221	6.1	150	85-3800	3-2 1/2x5 1/2	Ford	4 Ford	8F	H 6.6	14-5.9	W 303	FO4HV	162	264	162	TX	60	7 1/2x3 1/2x2 1/2	T	
11	Marmon-Herr	549	1583	123	123	7.50/17S	7.50/17S	7.50/17S	Ford V8	8-30x34	221	6.1	150	85-3800	3-2 1/2x5 1/2	Ford	4 Ford	8F	H 6.6	14-5.9	W 303	FO4HV	162	264	162	TX	60	7 1/2x3 1/2x2 1/2	T	
12	Marmon-Herr	550	1583	123	123	7.50/17S	7.50/17S	7.50/17S	Ford V8	8-30x34	221	6.1	150	85-3800	3-2 1/2x5 1/2	Ford	4 Ford	8F	H 6.6	14-5.9	W 303	FO4HV	162	264	162	TX	60	7 1/2x3 1/2x2 1/2	T	
13	Marmon-Herr	551	1583	123	123	7.50/17S	7.50/17S	7.50/17S	Ford V8	8-30x34	221	6.1	150	85-3800	3-2 1/2x5 1/2	Ford	4 Ford	8F	H 6.6	14-5.9	W 303	FO4HV	162	264	162	TX	60	7 1/2x3 1/2x2 1/2	T	
14	Marmon-Herr	552	1583	123	123	7.50/17S	7.50/17S	7.50/17S	Ford V8	8-30x34	221	6.1	150	85-3800	3-2 1/2x5 1/2	Ford	4 Ford	8F	H 6.6	14-5.9	W 303	FO4HV	162	264	162	TX	60	7 1/2x3 1/2x2 1/2	T	
15	Marmon-Herr	553	1583	123	123	7.50/17S	7.50/17S	7.50/17S	Ford V8	8-30x34	221	6.1	150	85-3800	3-2 1/2x5 1/2	Ford	4 Ford	8F	H 6.6	14-5.9	W 303	FO4HV	162	264	162	TX	60	7 1/2x3 1/2x2 1/2	T	
16	Marmon-Herr	554	1583	123	123	7.50/17S	7.50/17S	7.50/17S	Ford V8	8-30x34	221	6.1	150	85-3800	3-2 1/2x5 1/2	Ford	4 Ford	8F	H 6.6	14-5.9	W 303	FO4HV	162	264	162	TX	60	7 1/2x3 1/2x2 1/2	T	
17	Marmon-Herr	555	1583	123	123	7.50/17S	7.50/17S	7.50/17S	Ford V8	8-30x34	221	6.1	150	85-3800	3-2 1/2x5 1/2	Ford	4 Ford	8F	H 6.6	14-5.9	W 303	FO4HV	162	264	162	TX	60	7 1/2x3 1/2x2 1/2	T	
18	Marmon-Herr	556	1583	123	123	7.50/17S	7.50/17S	7.50/17S	Ford V8	8-30x34	221	6.1	150	85-3800	3-2 1/2x5 1/2	Ford	4 Ford	8F	H 6.6	14-5.9	W 303	FO4HV	162	264	162	TX	60	7 1/2x3 1/2x2 1/2	T	
19	Marmon-Herr	557	1583	123	123	7.50/17S	7.50/17S	7.50/17S	Ford V8	8-30x34	221	6.1	150	85-3800	3-2 1/2x5 1/2	Ford	4 Ford	8F	H 6.6	14-5.9	W 303	FO4HV	162	264	162	TX	60	7 1/2x3 1/2x2 1/2	T	
20	Marmon-Herr	558	1583	123	123	7.50/17S	7.50/17S	7.50/17S	Ford V8	8-30x34	221	6.1	150	85-3800	3-2 1/2x5 1/2	Ford	4 Ford	8F	H 6.6	14-5.9	W 303	FO4HV	162	264	162	TX	60	7 1/2x3 1/2x2 1/2	T	
21	Marmon-Herr	559	1583	123	123	7.50/17S	7.50/17S	7.50/17S	Ford V8	8-30x34	221	6.1	150	85-3800	3-2 1/2x5 1/2	Ford	4 Ford	8F	H 6.6	14-5.9	W 303	FO4HV	162	264	162	TX	60	7 1/2x3 1/2x2 1/2	T	
22	Marmon-Herr	560	1583	123	123	7.50/17S	7.50/17S	7.50/17S	Ford V8	8-30x34	221	6.1	150	85-3800	3-2 1/2x5 1/2	Ford	4 Ford	8F	H 6.6	14-5.9	W 303	FO4HV	162	264	162	TX	60	7 1/2x3 1/2x2 1/2	T	
23	Marmon-Herr	561	1583	123	123	7.50/17S	7.50/17S	7.50/17S	Ford V8	8-30x34	221	6.1	150	85-3800	3-2 1/2x5 1/2	Ford	4 Ford	8F	H 6.6	14-5.9	W 303	FO4HV	162	264	162	TX	60	7 1/2x3 1/2x2 1/2	T	
24	Marmon-Herr	562	1583	123	123	7.50/17S	7.50/17S	7.50/17S	Ford V8	8-30x34	221	6.1	150	85-3800	3-2 1/2x5 1/2	Ford	4 Ford	8F	H 6.6	14-5.9	W 303	FO4HV	162	264	162	TX	60	7 1/2x3 1/2x2 1/2	T	
25	Marmon-Herr	563	1583	123	123	7.50/17S	7.50/17S	7.50/17S	Ford V8	8-30x34	221	6.1	150	85-3800	3-2 1/2x5 1/2	Ford	4 Ford	8F	H 6.6	14-5.9	W 303	FO4HV	162	264	162	TX	60	7 1/2x3 1/2x2 1/2	T	
26	Marmon-Herr	564	1583	123	123	7.50/17S	7.50/17S	7.50/17S	Ford V8	8-30x34	221	6.1	150	85-3800	3-2 1/2x5 1/2	Ford	4 Ford	8F	H 6.6	14-5.9	W 303	FO4HV	162	264	162	TX	60	7 1/2x3 1/2x2 1/2	T	
27	Marmon-Herr	565	1583	123	123	7.50/17S	7.50/17S	7.50/17S	Ford V8	8-30x34	221	6.1	150	85-3800	3-2 1/2x5 1/2	Ford	4 Ford	8F	H 6.6	14-5.9	W 303	FO4HV	162	264	162	TX	60	7 1/2x3 1/2x2 1/2	T	
28	Marmon-Herr	566	1583	123	123	7.50/17S	7.50/17S	7.50/17S	Ford V8	8-30x34	221	6.1	150	85-3800	3-2 1/2x5 1/2	Ford	4 Ford	8F	H 6.6	14-5.9	W 303	FO4HV	162	264	162	TX	60	7 1/2x3 1/2x2 1/2	T	
29	Marmon-Herr	567	1583	123	123	7.50/17S	7.50/17S	7.50/17S	Ford V8	8-30x34	221	6.1	150	85-3800	3-2 1/2x5 1/2	Ford	4 Ford	8F	H 6.6	14-5.9	W 303	FO4HV	162	264	162	TX	60	7 1/2x3 1/2x2 1/2	T	
30	Marmon-Herr	568	1583	123	123	7.50/17S	7.50/17S	7.50/17S	Ford V8	8-30x34	221	6.1	150	85-3800	3-2 1/2x5 1/2	Ford	4 Ford	8F	H 6.6	14-5.9	W 303	FO4HV	162	264	162	TX	60	7 1/2x3 1/2x2 1/2	T	
31	Marmon-Herr	569	1583	123	123	7.50/17S	7.50/17S	7.50/17S	Ford V8	8-30x34	221	6.1	150	85-3800	3-2 1/2x5 1/2	Ford	4 Ford	8F	H 6.6	14-5.9	W 303	FO4HV	162	264	162	TX	60	7 1/2x3 1/2x2 1/2	T	
32	Marmon-Herr	570	1583	123	123	7.50/17S	7.50/17S	7.50/17S	Ford V8	8-30x34	221	6.1	150	85-3800	3-2 1/2x5 1/2	Ford	4 Ford	8F	H 6.6	14-5.9	W 303	FO4HV	162	264	162	TX	60	7 1/2x3 1/2x2 1/2	T	
33	Marmon-Herr	571	1583	123	123	7.50/17S	7.50/17S	7.50/17S	Ford V8	8-30x34	221	6.1	150	85-3800	3-2 1/2x5 1/2	Ford	4 Ford	8F	H 6.6	14-5.9	W 303	FO4HV	162	264	162	TX	60	7 1/2x3 1/2x2 1/2	T	
34	Marmon-Herr	572	1583	123	123	7.50/17S	7.50/17S	7.50/17S	Ford V8	8-30x34	221	6.1	150	85-3800	3-2 1/2x5 1/2	Ford	4 Ford	8F	H 6.6	14-5.9	W 303	FO4HV	162	264	162	TX	60	7 1/2x3 1/2x2 1/2	T	
35	Marmon-Herr	573	1583	123	123	7.50/17S	7.50/17S	7.50/17S	Ford V8	8-30x34	221	6.1	150	85-3800	3-2 1/2x5 1/2	Ford	4 Ford	8F	H 6.6	14-5.9	W 303	FO4HV	162	264	162	TX	60	7 1/2x3 1/2x2 1/2	T	
36	Marmon-Herr	574	1583	123	123	7.50/17S	7.50/17S	7.50/17S	Ford V8	8-30x34	221	6.1	150	85-3800	3-2 1/2x5 1/2	Ford	4 Ford	8F	H 6.6	14-5.9	W 303	FO4HV	162	264	162	TX	60	7 1/2x3 1/2x2 1/2	T	
37	Marmon-Herr	575	1583	123	123	7.50/17S	7.50/17S	7.50/17S	Ford V8	8-30x34	221	6.1	150	85-3800	3-2 1/2x5 1/2	Ford	4 Ford	8F	H 6.6	14-5.9	W 303	FO4HV	162	264	162	TX	60	7 1/2x3 1/2x2 1/2	T	
38	Marmon-Herr	576	1583	123	123	7.50/17S	7.50/17S	7.50/17S	Ford V8	8-30x34	221	6.1	150	85-3800	3-2 1/2x5 1/2	Ford	4 Ford	8F	H 6.6	14-5.9	W 303	FO4HV	162	264	162	TX	60	7 1/2x3 1/2x2 1/2	T	
39	Marmon-Herr	577	1583	123	123	7.50/17S	7.50/17S	7.50/17S	Ford V8	8-30x34	221	6.1	150	85-3800	3-2 1/2x5 1/2	Ford	4 Ford	8F	H 6.6	14-5.9	W 303	FO4HV	162	264	162	TX	60	7 1/2x3 1/2x2 1/2	T	
40	Marmon-Herr	578	1583	123	123	7.50/17S	7.50/17S	7.50/17S	Ford V8	8-30x34	221	6.1	150	85-3800	3-2 1/2x5 1/2	Ford	4 Ford	8F	H 6.6	14-5.9	W 303	FO4HV	162	264	162	TX	60	7 1/2x3 1/2x2 1/2	T	
41	Marmon-Herr	579	1583	123	123	7.50/17S	7.50/17S	7.50/17S	Ford V8	8-30x34	221	6.1	150	85-3800	3-2 1/2x5 1/2	Ford	4 Ford	8F	H 6.6	14-5.9	W 303	FO4								



	7-8	9-10	11-12	13-14	15-16	17-18	19-20	21-22	23-24	25-26	27-28	29-30	31-32	33-34	35-36	37-38	39-40	41-42	43-44	45-46	47-48	49-50	51-52	53-54	55-56	57-58	59-60	61-62	63-64	65-66	67-68	69-70	71-72	73-74	75-76	77-78	79-80	81-82	83-84	85-86	87-88	89-90	91-92	93-94	95-96	97-98	99-100	101-102	103-104	105-106	107-108	109-110	111-112	113-114	115-116	117-118	119-120	121-122	123-124	125-126	127-128	129-130	131-132	133-134	135-136	137-138	139-140	141-142	143-144	145-146	147-148	149-150	151-152	153-154	155-156	157-158	159-160	161-162	163-164	165-166	167-168	169-170	171-172	173-174	175-176	177-178	179-180	181-182	183-184	185-186	187-188	189-190	191-192	193-194	195-196	197-198	199-200	201-202	203-204	205-206	207-208	209-210	211-212	213-214	215-216	217-218	219-220	221-222	223-224	225-226	227-228	229-230	231-232	233-234	235-236	237-238	239-240	241-242	243-244	245-246	247-248	249-250	251-252	253-254	255-256	257-258	259-260	261-262	263-264	265-266	267-268	269-270	271-272	273-274	275-276	277-278	279-280	281-282	283-284	285-286	287-288	289-290	291-292	293-294	295-296	297-298	299-300	301-302	303-304	305-306	307-308	309-310	311-312	313-314	315-316	317-318	319-320	321-322	323-324	325-326	327-328	329-330	331-332	333-334	335-336	337-338	339-340	341-342	343-344	345-346	347-348	349-350	351-352	353-354	355-356	357-358	359-360	361-362	363-364	365-366	367-368	369-370	371-372	373-374	375-376	377-378	379-380	381-382	383-384	385-386	387-388	389-390	391-392	393-394	395-396	397-398	399-400	401-402	403-404	405-406	407-408	409-410	411-412	413-414	415-416	417-418	419-420	421-422	423-424	425-426	427-428	429-430	431-432	433-434	435-436	437-438	439-440	441-442	443-444	445-446	447-448	449-450	451-452	453-454	455-456	457-458	459-460	461-462	463-464	465-466	467-468	469-470	471-472	473-474	475-476	477-478	479-480	481-482	483-484	485-486	487-488	489-490	491-492	493-494	495-496	497-498	499-500	501-502	503-504	505-506	507-508	509-510	511-512	513-514	515-516	517-518	519-520	521-522	523-524	525-526	527-528	529-530	531-532	533-534	535-536	537-538	539-540	541-542	543-544	545-546	547-548	549-550	551-552	553-554	555-556	557-558	559-560	561-562	563-564	565-566	567-568	569-570	571-572	573-574	575-576	577-578	579-580	581-582	583-584	585-586	587-588	589-590	591-592	593-594	595-596	597-598	599-600	601-602	603-604	605-606	607-608	609-610	611-612	613-614	615-616	617-618	619-620	621-622	623-624	625-626	627-628	629-630	631-632	633-634	635-636	637-638	639-640	641-642	643-644	645-646	647-648	649-650	651-652	653-654	655-656	657-658	659-660	661-662	663-664	665-666	667-668	669-670	671-672	673-674	675-676	677-678	679-680	681-682	683-684	685-686	687-688	689-690	691-692	693-694	695-696	697-698	699-700	701-702
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Line Number	MAKE AND MODEL	GENERAL (See Keynote)			TIRE SIZES		ENGINE DETAILS						TRANS-MISSION		REAR AXLE		FRONT AXLE	BRAKES				FRAME																
		Tonnage Rating	Chassis Price	Standard Wheelbase	Max. Wt. Furnished	Gross Vehicle Weight with Max. Tires	Chassis Wt. (Stripped)	Standard Front and Rear	Dual rear 5-single rear	No. of Cylinders, Stroke	Displacement	Comp. Ratio	Torque lb. ft.	H.P. at R.P.M.	Number, Diameter, and Length	Governor Standard	Make and Model	Forward Spd's	Make and Model	Gear and Type	Drive & Torque	Range in High	Make and Model	Location	Operat'n	Lining Area	Drum Area	Drum Material	Hand Location	C-A Dimension (Std. W. B.)	Side Rail Dimensions	Type						
1	Ster. FBT152 2C2F	8-10	4105	177	207	32000	9475	9.00/20D	404	5.7	267	89-2400	2 1/2 x 12 1/2	Y	Own U25	6-3 1/2 x 4	216	6.2	170	78-3200	4	3 1/2 x 11 1/2	4	Own U25	5	Tim SR251H	5	57-7.80	Tim 35000N	L4THV	584	1024	a	XX	91	10-3 1/2 x 1 1/2	T	
2	Ing. FW8162 4R	8-10	4550	177	207	32000	9475	9.00/20D	404	5.7	267	89-2400	2 1/2 x 12 1/2	Y	Own U25	6-3 1/2 x 4	216	6.2	170	78-3200	4	3 1/2 x 11 1/2	4	Own U25	5	Tim SR251H	5	57-7.80	Tim 35000N	L4THV	584	1024	a	XX	91	10-3 1/2 x 1 1/2	T	
3	Ing. FD8180 4R	10-12	4550	181	211	40000	13500	9.75/20D	404	5.7	267	89-2400	2 1/2 x 12 1/2	Y	Own U25	6-3 1/2 x 4	216	6.2	170	78-3200	4	3 1/2 x 11 1/2	4	Own U25	5	Tim SR251H	5	57-7.80	Tim 35000N	L4THV	584	1024	a	XX	91	10-3 1/2 x 1 1/2	T	
4	(7) HC8210 4R	12-18	1155	185	201	35000	14655	40x3D	404	5.7	267	89-2400	2 1/2 x 12 1/2	Y	Own U25	6-3 1/2 x 4	216	6.2	170	78-3200	4	3 1/2 x 11 1/2	4	Own U25	5	Tim SR251H	5	57-7.80	Tim 35000N	L4THV	584	1024	a	XX	91	10-3 1/2 x 1 1/2	T	
5	(6) TRC-2X250 2F	...	1653	154	216	20000	5900	7.00/20xD	216	6.2	170	78-3200	4	3 1/2 x 11 1/2	Y	Own U25	6-3 1/2 x 4	216	6.2	170	78-3200	4	3 1/2 x 11 1/2	4	Own U25	5	Tim SR251H	5	57-7.80	Tim 35000N	L4THV	584	1024	a	XX	91	10-3 1/2 x 1 1/2	T
6	(6) TRC-2X400 2F	...	1869	157	218	24000	6100	7.00/20xD	216	6.2	170	78-3200	4	3 1/2 x 11 1/2	Y	Own U25	6-3 1/2 x 4	216	6.2	170	78-3200	4	3 1/2 x 11 1/2	4	Own U25	5	Tim SR251H	5	57-7.80	Tim 35000N	L4THV	584	1024	a	XX	91	10-3 1/2 x 1 1/2	T
7	(6) TRC-2X250 2F	...	1869	157	218	24000	6100	7.00/20xD	216	6.2	170	78-3200	4	3 1/2 x 11 1/2	Y	Own U25	6-3 1/2 x 4	216	6.2	170	78-3200	4	3 1/2 x 11 1/2	4	Own U25	5	Tim SR251H	5	57-7.80	Tim 35000N	L4THV	584	1024	a	XX	91	10-3 1/2 x 1 1/2	T
8	(6) TRC-2X250 2F	...	1869	157	218	24000	6100	7.00/20xD	216	6.2	170	78-3200	4	3 1/2 x 11 1/2	Y	Own U25	6-3 1/2 x 4	216	6.2	170	78-3200	4	3 1/2 x 11 1/2	4	Own U25	5	Tim SR251H	5	57-7.80	Tim 35000N	L4THV	584	1024	a	XX	91	10-3 1/2 x 1 1/2	T
9	(6) TRC-2X250 2F	...	1869	157	218	24000	6100	7.00/20xD	216	6.2	170	78-3200	4	3 1/2 x 11 1/2	Y	Own U25	6-3 1/2 x 4	216	6.2	170	78-3200	4	3 1/2 x 11 1/2	4	Own U25	5	Tim SR251H	5	57-7.80	Tim 35000N	L4THV	584	1024	a	XX	91	10-3 1/2 x 1 1/2	T
10	(6) TRC-2X250 2F	...	1869	157	218	24000	6100	7.00/20xD	216	6.2	170	78-3200	4	3 1/2 x 11 1/2	Y	Own U25	6-3 1/2 x 4	216	6.2	170	78-3200	4	3 1/2 x 11 1/2	4	Own U25	5	Tim SR251H	5	57-7.80	Tim 35000N	L4THV	584	1024	a	XX	91	10-3 1/2 x 1 1/2	T
11	(6) TRC-2X250 2F	...	1869	157	218	24000	6100	7.00/20xD	216	6.2	170	78-3200	4	3 1/2 x 11 1/2	Y	Own U25	6-3 1/2 x 4	216	6.2	170	78-3200	4	3 1/2 x 11 1/2	4	Own U25	5	Tim SR251H	5	57-7.80	Tim 35000N	L4THV	584	1024	a	XX	91	10-3 1/2 x 1 1/2	T
12	(6) TRC-2X250 2F	...	1869	157	218	24000	6100	7.00/20xD	216	6.2	170	78-3200	4	3 1/2 x 11 1/2	Y	Own U25	6-3 1/2 x 4	216	6.2	170	78-3200	4	3 1/2 x 11 1/2	4	Own U25	5	Tim SR251H	5	57-7.80	Tim 35000N	L4THV	584	1024	a	XX	91	10-3 1/2 x 1 1/2	T
13	(6) TRC-2X250 2F	...	1869	157	218	24000	6100	7.00/20xD	216	6.2	170	78-3200	4	3 1/2 x 11 1/2	Y	Own U25	6-3 1/2 x 4	216	6.2	170	78-3200	4	3 1/2 x 11 1/2	4	Own U25	5	Tim SR251H	5	57-7.80	Tim 35000N	L4THV	584	1024	a	XX	91	10-3 1/2 x 1 1/2	T
14	(6) TRC-2X250 2F	...	1869	157	218	24000	6100	7.00/20xD	216	6.2	170	78-3200	4	3 1/2 x 11 1/2	Y	Own U25	6-3 1/2 x 4	216	6.2	170	78-3200	4	3 1/2 x 11 1/2	4	Own U25	5	Tim SR251H	5	57-7.80	Tim 35000N	L4THV	584	1024	a	XX	91	10-3 1/2 x 1 1/2	T
15	(6) TRC-2X250 2F	...	1869	157	218	24000	6100	7.00/20xD	216	6.2	170	78-3200	4	3 1/2 x 11 1/2	Y	Own U25	6-3 1/2 x 4	216	6.2	170	78-3200	4	3 1/2 x 11 1/2	4	Own U25	5	Tim SR251H	5	57-7.80	Tim 35000N	L4THV	584	1024	a	XX	91	10-3 1/2 x 1 1/2	T
16	(6) TRC-2X250 2F	...	1869	157	218	24000	6100	7.00/20xD	216	6.2	170	78-3200	4	3 1/2 x 11 1/2	Y	Own U25	6-3 1/2 x 4	216	6.2	170	78-3200	4	3 1/2 x 11 1/2	4	Own U25	5	Tim SR251H	5	57-7.80	Tim 35000N	L4THV	584	1024	a	XX	91	10-3 1/2 x 1 1/2	T
17	(6) TRC-2X250 2F	...	1869	157	218	24000	6100	7.00/20xD	216	6.2	170	78-3200	4	3 1/2 x 11 1/2	Y	Own U25	6-3 1/2 x 4	216	6.2	170	78-3200	4	3 1/2 x 11 1/2	4	Own U25	5	Tim SR251H	5	57-7.80	Tim 35000N	L4THV	584	1024	a	XX	91	10-3 1/2 x 1 1/2	T
18	(6) TRC-2X250 2F	...	1869	157	218	24000	6100	7.00/20xD	216	6.2	170	78-3200	4	3 1/2 x 11 1/2	Y	Own U25	6-3 1/2 x 4	216	6.2	170	78-3200	4	3 1/2 x 11 1/2	4	Own U25	5	Tim SR251H	5	57-7.80	Tim 35000N	L4THV	584	1024	a	XX	91	10-3 1/2 x 1 1/2	T
19	(6) TRC-2X250 2F	...	1869	157	218	24000	6100	7.00/20xD	216	6.2	170	78-3200	4	3 1/2 x 11 1/2	Y	Own U25	6-3 1/2 x 4	216	6.2	170	78-3200	4	3 1/2 x 11 1/2	4	Own U25	5	Tim SR251H	5	57-7.80	Tim 35000N	L4THV	584	1024	a	XX	91	10-3 1/2 x 1 1/2	T
20	(6) TRC-2X250 2F	...	1869	157	218	24000	6100	7.00/20xD	216	6.2	170	78-3200	4	3 1/2 x 11 1/2	Y	Own U25	6-3 1/2 x 4	216	6.2	170	78-3200	4	3 1/2 x 11 1/2	4	Own U25	5	Tim SR251H	5	57-7.80	Tim 35000N	L4THV	584	1024	a	XX	91	10-3 1/2 x 1 1/2	T
21	White... 904 4R	...	3185	160	214	...	7260	7.00/20D	270	5.8	200	91-2500	7 1/2 x 10 7/8	Y	Own 270	6-3 1/2 x 4	270	5.8	200	91-2500	7	3 1/2 x 10 7/8	7	Own 270	4	Tim SBD 1000 2F	4	52-8.30	Own 16D	L61HV	514	843	a	TX	84	7-2 1/2 x 1 1/2	TF	
22	White... 918 4R	...	3185	160	214	...	7260	7.00/20D	270	5.8	200	91-2500	7 1/2 x 10 7/8	Y	Own 270	6-3 1/2 x 4	270	5.8	200	91-2500	7	3 1/2 x 10 7/8	7	Own 270	4	Tim SBD 1000 2F	4	52-8.30	Own 16D	L61HV	514	843	a	TX	84	7-2 1/2 x 1 1/2	TF	
23	White... 920 4R	...	3185	160	214	...	7260	7.00/20D	270	5.8	200	91-2500	7 1/2 x 10 7/8	Y	Own 270	6-3 1/2 x 4	270	5.8	200	91-2500	7	3 1/2 x 10 7/8	7	Own 270	4	Tim SBD 1000 2F	4	52-8.30	Own 16D	L61HV	514	843	a	TX	84	7-2 1/2 x 1 1/2	TF	
24	White... 920 4R	...	3185	160	214	...	7260	7.00/20D	270	5.8	200	91-2500	7 1/2 x 10 7/8	Y	Own 270	6-3 1/2 x 4	270	5.8	200	91-2500	7	3 1/2 x 10 7/8	7	Own 270	4	Tim SBD 1000 2F	4	52-8.30	Own 16D	L61HV	514	843	a	TX	84	7-2 1/2 x 1 1/2	TF	
25	White... 920 4R	...	3185	160	214	...	7260	7.00/20D	270	5.8	200	91-2500	7 1/2 x 10 7/8	Y	Own 270	6-3 1/2 x 4	270	5.8	200	91-2500	7	3 1/2 x 10 7/8	7	Own 270	4	Tim SBD 1000 2F	4	52-8.30	Own 16D	L61HV	514	843	a	TX	84	7-2 1/2 x 1 1/2	TF	
26	White... 920 4R	...	3185	160	214	...	7260	7.00/20D	270	5.8	200	91-2500	7 1/2 x 10 7/8	Y	Own 270	6-3 1/2 x 4	270	5.8	200	91-2500	7	3 1/2 x 10 7/8	7	Own 270	4	Tim SBD 1000 2F	4	52-8.30	Own 16D	L61HV	514	843	a	TX	84	7-2 1/2 x 1 1/2	TF	

† Denotes new models or change in specifications. (\*) Price includes chassis and cab.

## NEWSCAST (Continued from page 42)

### Factory Notes

Turning now to a few industrial notes of interest we find these items from the truck factories . . . a new \$150,000 truck sales and service building is to be erected at 35th Ave. and 44th St., Long Island City, N. Y., for International Harvester Co. It is to be I.H.C.'s headquarters for all Long Island north of Brooklyn and the old quarters at 44th Road and Vernon Ave. will be abandoned. . . . Studebaker scored 10,974 passenger car and truck sales during April, more than the whole second quarter of last year. A new Studebaker branch has been opened in Omaha, Neb., with C. H. Monahan in charge. . . . Nelson-LeMoon Truck Co. of Chicago has purchased the Chicago branch of the Federal Motor Truck Co., and will henceforth be known as the Federal-LeMoon Co. The company has discontinued the manufacture of LeMoon trucks and will devote its time to the sales and service of Federal trucks for which it is franchised as Chicago Distributor. . . . Federal stockholders, by the way, recently extended the Articles of Association for an additional 30-year period. Present directors and officers were all re-elected. . . . and when you see how clean the New York World's Fair grounds are kept, think of the 12 new Autocars, recently delivered, and equipped with the latest in sanitation equipment.

Among the suppliers, word has it that Goodrich is erecting a \$1,500,000 mechanical rubber goods factory at Clarksville, Tenn. The company has also taken on for national distribution two new horns, known as "Clearway" and "Multitone" and the Tripe and Supreme auxiliary driving lights. . . . Champion Spark Plug Co. has announced a most important merchandising decision, namely that all of its dealings are henceforth under the provisions of the Fair Trade Acts designed to maintain a fixed price schedule. . . . The addition of three new warehouses by the Sealed Power Corp., located at Jacksonville, Fla.; Richmond, Va.; and Baltimore, Md., raises the total to 21 and makes Sealed Power products all the easier to obtain.

Taking advantage of the greater facilities offered by the Port Authority Building at 111 Eighth Ave., DeVilbiss has moved its New York City sales and service branch to that address. . . . Toledo Steel Products has opened new warehouses in Pittsburgh, Memphis and Jacksonville to further facilitate its distribution. . . . those air-driven Sterling sanders will now be manufactured and serviced on the West Coast from a new Sterling Products factory at 8925 Aguinaldo Ave., Los Angeles, where activities of the Detroit factory will be supplemented. . . . and as a final sidelight, du Pont tells us that down on the exposure farms where they test all kinds and colors of finishes, no less than 60,000 panels are now exposed to the elements in Delaware, Florida and Texas.

### Personal

Getting personal this month takes us on a pretty rapid hop. So let us begin right here at home where we find the new chairman of the Philadelphia section of the Society of Automotive Engineers is none other than Henry Jennings, our own technical editor. The vice-chairman is William Schwarze, Jr., White district service manager. In New York, the Metropolitan section has named T. L. Preble, of Tide Water Oil Co., as chairman and Clayton Farria, president of Trucktor Corp., as vice-chairman.

For the fifth time, Robert F. Black was re-elected president of the White Motor Corp., along with all of the directors. Changes within the same corporation include the resignation of L. C. Watson as sales manager of Manhattan, Bronx and Westchester territories. He will operate independently as a White distributor in Westchester. Ray Davis has been named district service manager with headquarters at the company's Long Island City branch. At Buffalo, O. D. Gagnon replaces D. L. Hennigar, resigned, as branch manager.

A Studebaker series of appointments goes like this: Arthur J. Chanter becomes regional manager at Boston replacing George E. Read, who takes the same post in Pittsburgh, where he replaces F. L. Beelby, who has been named wholesale supervisor of the Chicago and St. Louis territories.

Stewart Warner has announced the appointment of Fred R. Cross as sales manager of the Alemite Retail Sales Division. He succeeds C. A. Fine who will be transferred to new duties. . . . M. J. O'Neill,

(TURN TO PAGE 123, PLEASE)

Seven more months of  
Studebaker satisfaction sees

# 194 more STUDEBAKER CAB-FORWARDS

added to this great nation-wide fleet!

**STUDEBAKER Cab-Forward TRUCKS**

**Railway Express Service Shows the Stuff a Truck is made of!**

TRANSPORTATION costs are the first concern of Railway Express Agency, operator of one of the world's largest truck fleets. These ten new Studebaker Cab-Forwards are part of the fleet of 286 Studebaker Cab-Forward trucks serving Railway Express shippers with real economy and dependability. Studebaker trucks range from 1000 pounds to 20,000 pounds gross capacity — Cab-Forward, Standard and Fast Delivery models.

**THE STUDEBAKER CORPORATION** TRUCK DIVISION **SOUTH BEND, IND.**

*The above advertisement appeared in November, 1938. It is reproduced, with latest news, to re-prove that "Studebaker Saves as it Serves."*

## NEW PRODUCTS

(CONTINUED FROM PAGE 36)

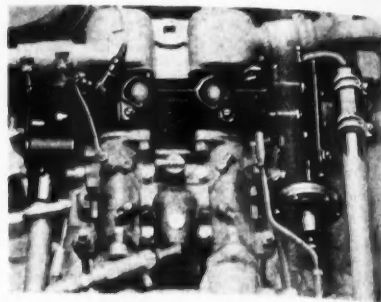
head covers the fabric break inside the casing. For a free sample, write The Wedler-Shuford Co., 2222 Olive St., St. Louis, Mo.

### Automatic Decelerating Control

An automatic decelerating control is being made by the Marvel Schebler Div. Borg-Warner Corp., for the California Machinery and Supply Co. The device eliminates fumes and backfiring through

the muffler and at the same time shows a substantial reduction in gasoline and oil consumption.

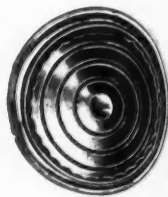
When the carburetor throttle closes the butterfly, valves in the decelerating control are automatically closed by means of a suction controlled piston, entirely eliminating communication between carburetor and engine, therefore no gasoline can enter engine during decelerating period. Closing the valves in the decelerator controls an air passage which is opened by the same piston admitting air to the intake manifold. The amount of air which is drawn through the air cleaner can be regulated. For full details address California Machinery and Supply Co., 2128 Los Angeles



St., Los Angeles, Cal., or 1910 John St., Flint, Mich.

### Do-Ray Flush Clearance Lamp

A new clearance lamp, that is only 1 1/2 in. high and gives maximum light from 1 1/2 cp. bulb is announced by Do-Ray Lamp Co., 1458 S. Michigan Ave., Chicago. This new number 1182 is compact and strongly built and a rust-proof bezel holds lens securely in place. Lenses are available in red, green, amber, or white.



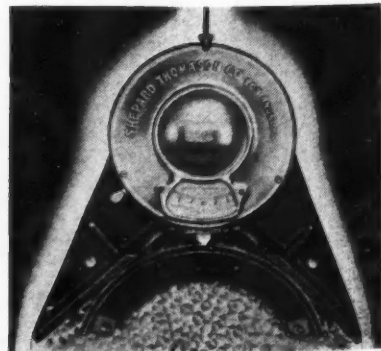
### Simmons Bumper Jack

A new Simmons mechanical bumper jack, introduced by the Simmons Mfg. Co., Ashland, Ohio, is adaptable for use with all cars having knee action and coil springs as well as conventional type suspensions. The jack has but one moving part, a machined steel lift screw 7/8 in. in diameter. The adjustable bumper clamp is a malleable iron casting which fits the bumper brackets on any car. This jack has a lifting range from 9 1/2 in. to 30 1/2 in.



### Micro Brake Shoe Gage

Fleetmen who take their brake work seriously should find a real interest in a



(TURN TO PAGE 62, PLEASE)

*It Takes a Tough Disposition  
for Tough Jobs*



**USE A PLUG DESIGNED  
FOR HEAVY DUTY ON  
HEAVY DUTY JOBS**



If you want to step up efficiency and mileage . . . and cut down gasoline consumption . . . use Edison Spark Plugs designed for heavy duty service. Edison heavy duty plugs are not just an off-shoot from a passenger car line. Each is specifically engineered for its particular heavy duty job, and no other.

Edison Spark Plugs are writing a record of economy across the ledgers of commercial operators from coast to coast. Prove it to yourself by trying just one set in any one of your units, from a lighter job on through to a semi-diesel, and add up the savings per mile.

EDISON-SPLITDORF CORP.  
West Orange, N. J.

**Only Edison Spark Plugs  
include**

**HI-VOLTAGE ALBANITE INSULATOR  
SEALED-IN ELECTRODE CAP  
BUILT-IN, LEAK-PROOF GASKET  
CONDENSER ACTION FLAT GAP**

**Edison SPARK PLUGS**

ONE OF THE  
*Thomas A. Edison*  
INDUSTRIES

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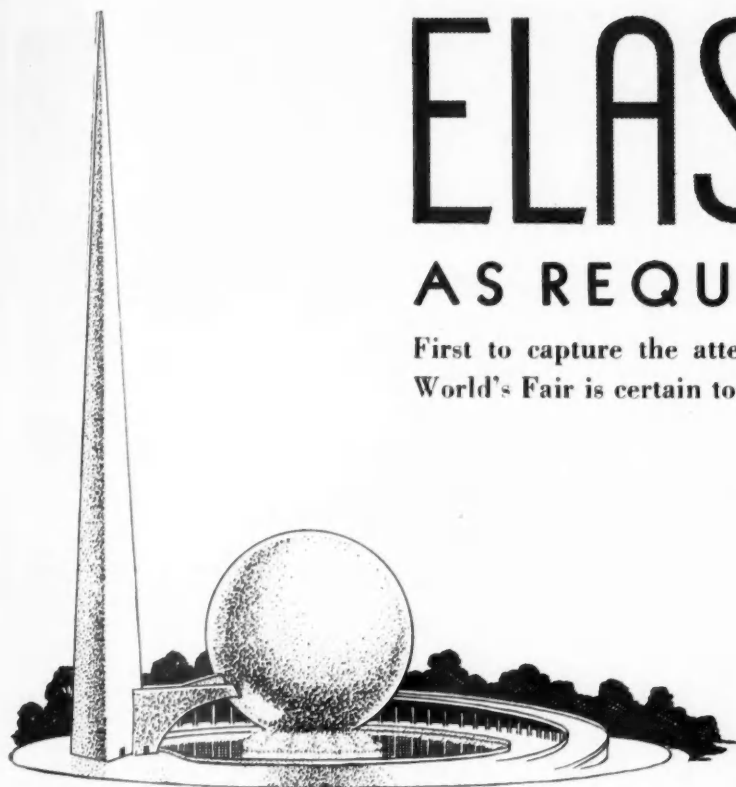
COMMERCIAL CAR JOURNAL  
JUNE, 1939



# ELASTICITY

## AS REQUIRED OF STEEL

First to capture the attention of visitors to the 1939 New York World's Fair is certain to be the Trylon.



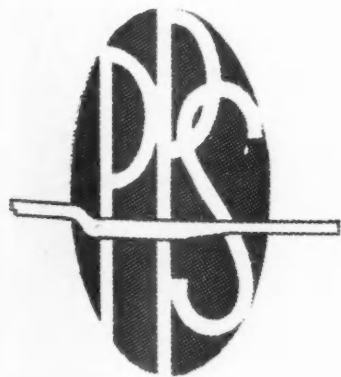
(C) N.Y.W.F.

This slender steel tower, rising 700 feet from a base 63 feet square to a mere 31 inches at the top will awe thousands as it glistens and sways. That it will sway is only characteristic of its structure, and since the smooth solid sides will provide greater surfaces for wind pressure, the beacon-topped head can be expected to nod in an appreciable arc, yet always eventually returning to its original position. Symbol of tomorrow, the Trylon is likewise a splendid example of elasticity in steel.

Parish Heat-Treated Frames, just as rigid as the Trylon when motionless, just as flexible as the tower in a gale, make the finest truck frames. Although overloaded, battered, twisted, Parish Heat-Treated Frames always return to their original shape when stress and strain are removed. Heat-Treatment gives these frames the resiliency they require to meet modern trucking needs.

By insisting upon Parish Heat-Treated Frames for your trucks and trailers, you are demanding frames which insure longer life because they resist greater fatigue. Good frames make vehicles stand up longer for better service. So make certain the rolling stock you buy from now on is assembled with Parish Heat-Treated Frames.

**PARISH PRESSED STEEL COMPANY, Reading, Pa.**  
**Subsidiary of SPICER MANUFACTURING CORPORATION**  
 Western Representative: F. Somers Peterson, 57 California St., San Francisco, Cal.



# PARISH

**PRESSED-STEEL • HEAT-TREATED FRAMES  
 FOR TRUCKS AND TRAILERS**

## NEW PRODUCTS

(CONTINUED FROM PAGE 60)

**new Micro Brake Shoe Gage** just introduced by Shepard-Thomason, Los Angeles, Cal. Purpose of the device is to measure the diameter of the brake shoe arc—with or without lining—to an accuracy of .005 in.

For full details address Shepard-Thomason, 2023 W. Gage Ave., Los Angeles, Cal.

### Stainless Steel Electrode

The Lincoln Electric Co., Cleveland, Ohio, announces a new arc welding electrode of the 18-8 type, having 3½ per cent

molybdenum. Designated "Stainweld C," it was developed to meet a demand for an arc welding electrode to weld the considerable number of stainless steels on the market which contain approximately 3½ per cent molybdenum.

### Diesel Compression Gage

A direct reading compression gage for diesel engines has been announced by the Bacharach Industrial Instrument Co., 7000 Bennett St., Pittsburgh, Pa. Known as the Premax Indicator, it can be used on running engines. The operation is simple. One injector is replaced by the indicator and the engine started. Index sleeve is



rotated by hand until the flashes of the neon light disappear. It is then possible to read the cylinder pressure directly from the indicator scale. Full details from the manufacturer.

### Collision Switch

An entirely new type of collision and tip-over switch has been put on the market by the Elsbert Mfg. Co., Inc., Chicago. Unlike previous switches of this class, the Elsbert switch is entirely mechanical and not only operates in case of overturning but



also in case of collision in front, back, or from either side, even though the vehicle remains upright. Any severe shock displaces a special weight and breaks the circuit. Contacts are silver plated. For full information write to the Elsbert Mfg. Co., Inc., at 353 West Grand Ave., Chicago, Ill.

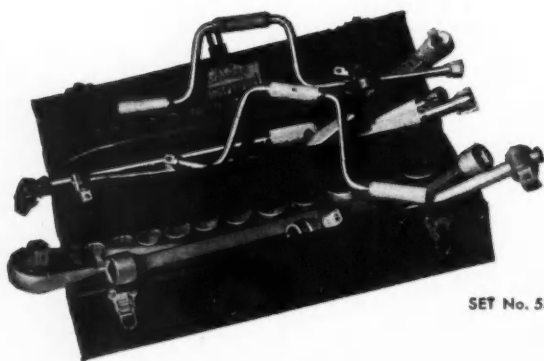
### Spin-A-Bin for Parts

Having all your bolts, nuts, screws, washers, shims, gaskets, fuses, contact points and other small parts neatly stored in a Spin-A-Bin is a sure time and temper saver. Each compartment may be labeled or a specimen wired to the front. Made by Noggle Products Co., Ann Arbor, Mich., it is available in a unit containing 24 bins each 3x3x2½ in., or 4x4x3 in.



**MORE NEW PRODUCTS ON PAGE 125**

## "55" shows 'em who's boss



SET No. 55

The most ornery nuts and bolts on busses, trucks and cars surrender when "55" goes to work on them. Even those hidden, hard-to-get-at "babies" yield easily when you choose one of these twenty-one "Supersockets", Standard and Heavy Duty — all different 12-point openings, 7/16 to 1½" — and a full line of handles, parts and socket wrench combinations to boot. Accessories include Offset, Sliding T and Flex Handles, Speeders, Ratchets, Extensions and Universal Joints. Strong, steel case. This Master Mechanic's Set is a real time- and money-saver. See it at your jobber's — today.

Write for literature of the complete Williams line including all types of wrenches, pliers, screw drivers, chisels and punches.

**WILLIAMS**  
SUPERIOR DROP-FORGED TOOLS  
**"SUPERSOCKETS"**

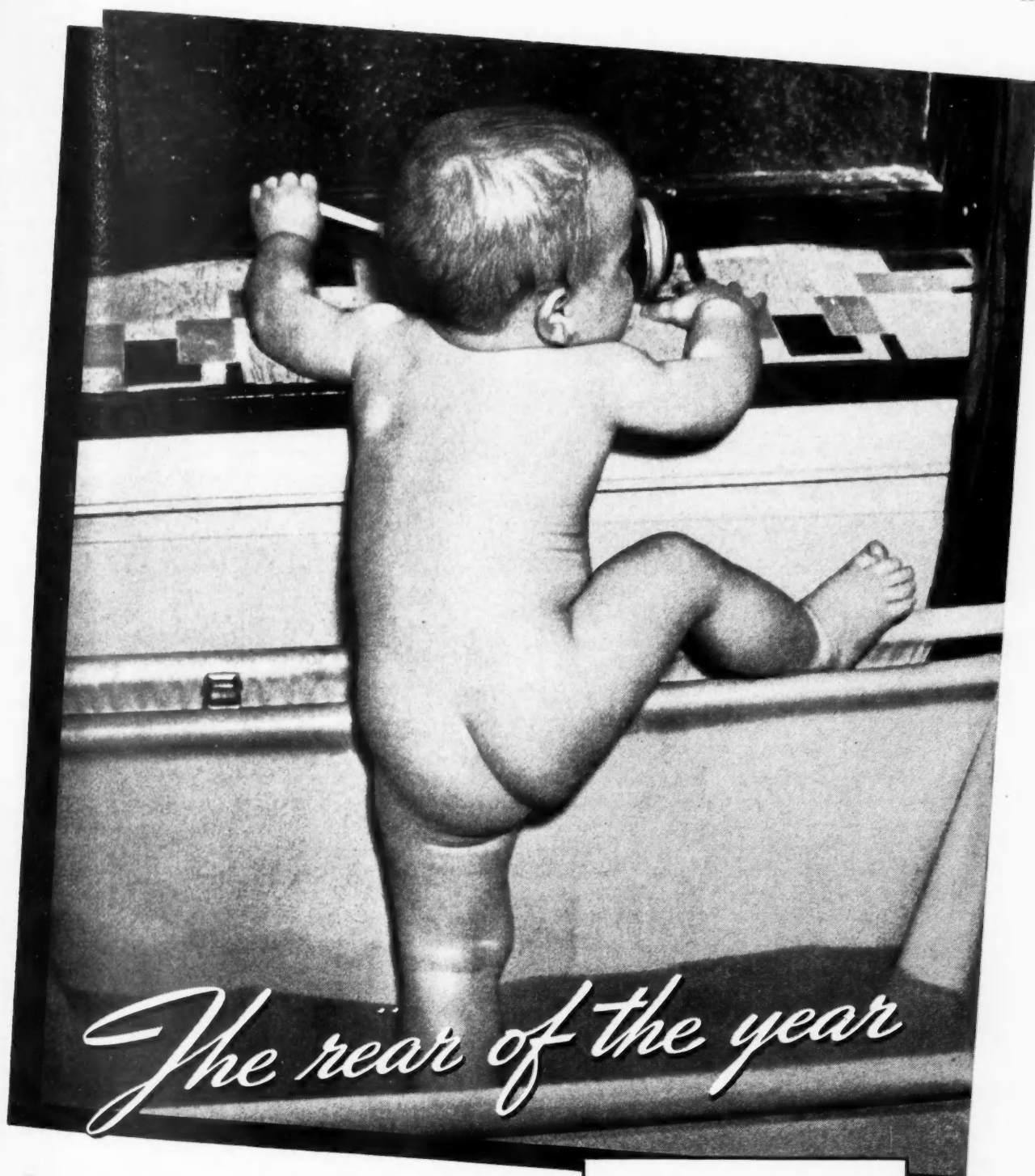
J. H. WILLIAMS & CO.

225 Lafayette St.

New York, N. Y.

Western Warehouse and Sales Office: Chicago

Works: Buffalo



*The rear of the year*

THERE'S a Timken 3 for 1 Axle that suits your kind of hauling job to a "T"! Now available on most makes of trucks . . . It lets you get exactly the type of final drive in the right gear ratio to give you finest truck performance . . . longest truck life . . . lowest maintenance costs. Tell your dealer you want a Timken 3 for 1 Axle on your next truck!

1 Rear Axle Housing that takes any one of 3 types of Final Drive

- Bevel Gear
- Double Reduction
- 2-Speed Double Reduction

in a complete range of gear ratios

# TIMKEN <sup>3 FOR 1</sup> AXLES

THE TIMKEN-DETROIT AXLE COMPANY • DETROIT, MICHIGAN  
WISCONSIN AXLE DIVISION • OSHKOSH, WISCONSIN

COMMERCIAL CAR JOURNAL  
JUNE, 1939

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## MEN AND METHODS

(CONTINUED FROM PAGE 29)

chargeable accidents for the year ending June 30, 1938, although they covered about the same mileage as in 1935. It might be mentioned, also, that the Boston Store was reported still at the lead at the "half-way point" on January 1, 1939, among all large department stores in the present annual contest of the National Safety Council.

Thus the question is—what new fleet management methods have enabled us to accomplish such a large accident reduction?

As previously stated, the only possible answer must be a rather general review of the reorganization of our delivery department.

### Rerouting Deliveries

The first step in this reorganization program was a careful analysis of our Chicago and suburban delivery field. This analysis was made necessary because we found much variation in the daily working hours of our drivers. Some would get in early and others would put in much overtime. This led to dissatisfactions among the drivers, too much overtime expense, and doubtless considerable speedy and hazardous driving both by drivers who wanted to get in still earlier and by those who wished to escape criticism for "too much" overtime. Also, there was considerable extra cost from drivers kept waiting around for special deliveries, most of which we later found could be handled by the regular drivers.

It required several months of experimenting, including a study of the time-recording charts on our trucks, to work out new evenly balanced delivery districts, taking into consideration total distances to be covered, and the percentages of paid versus C.O.D. packages. We planned the new districts so they also could be easily and fairly divided for two delivery trucks during Christmas and other special sales periods. As a follow-up comment, we have found that this careful balancing of our districts, and our new daily records of total packages delivered to each district, now have numerous business values. For instance, through a comparative study of package totals, our

main office can measure the localized results from special sales, community circularization of advertising, competing community sales, etc.

One of the immediate results from this reclassification of delivery districts was a considerable reduction in trucks and drivers regularly needed, and also the elimination of much driving overtime. Thus we were able to plan out more standardized working periods for our drivers and more systematic driver training methods; and these new plans and methods naturally included special attention to accident prevention. Toward this end we have worked out the following general supervising principles:

### Supervising Principles

1. Expect from all drivers a good honest day's work.
2. Give drivers and helpers as steady employment as possible.
3. Help drivers to eliminate personal worries.
4. Train drivers to avoid traffic arguments.
5. Keep trucks in best possible mechanical condition.
6. Get cooperation of drivers in winning fleet no-accident awards.

Fundamentally, we believe that the human element—the man behind the wheel—is the key to our fleet safety. But this statement needs interpretations. We also must help our drivers to keep in good physical and mental condition for their work; and also provide them with good equipment for their jobs. We now require all drivers to have annual physical examinations; and we do all that we can to provide all of our regular drivers and helpers with steady employment. We do not believe our drivers profit by or want "an easy time." With scheduled full days they are more contented, do better work, and feel more certain of their jobs.

We continue to make careful studies of our package totals for delivery districts, to know how many packages a driver and his helper normally can handle as a day's work. These studies are aided by our time-recording dials. We have about half as many time recorders as trucks and thus shift them about. We do not do this with secret spying intent. Our drivers are kept informed about our "time studies"; and this knowledge undoubtedly is a tonic to more steady work. We often call in a driver for "explanations" when the dial on his

truck, changed every third day, indicates prolonged idle periods.

We keep a driver and his helper assigned mostly to a regular district. He thus comes to know all the accident hazards of his territory—the bad streets, crossings, intersections. He and his helper also become acquainted with all the Store's regular customers; and at rush times when the district must be divided and the helper becomes the driver of the extra truck, he also thoroughly knows the driving hazards and the Store's regular customers.

We expect each driver to do a good steady day's work. But, in the interest of accident-control, we do not have any hard and fast delivery quotas or time schedules which might cause a driver to take extra driving risks. We tell our drivers that we would much rather pay over-time once in a while, rather than to have them take chances on marring their own and our Fleet Safety record.

We help our drivers to earn extra money during the "special store-wide sales" which we conduct two or three times a year. The sale is usually on some single item, such as men's shirts or women's hosiery, sold in large volume at special bargain prices from cellophane-wrapped samples. Various chance and volume prizes are offered, in addition to small sales commissions. Most of our drivers take an active part in the contest which usually continues for a month, and some of them make high sales records. One of them recently was lucky enough to win the grand prize automobile, awarded to the one who had turned in the lucky sales slip drawn from all that were turned in.

Another encouragement to our helpers is the fact that our new drivers are chosen from our trained helpers. All but two or three of our present helpers are trained to the point where they are licensed chauffeurs. Thus they are qualified, during Christmas and other special sales periods, to drive our extra trucks, with extra helpers to assist them. The helper is paid regular driver's wages and he usually has four to six weeks of such work during the year. The best qualified of these helpers thus are in line when we need a new driver; and new regular helpers are likewise chosen from among our extra helpers.

There are a number of ways in  
(TURN TO PAGE 66, PLEASE)

HERE'S YOUR SPARK PLUG  
"ANSWER!"



AC



**AC**

**SPARK  
PLUGS**

*- for Thirty Years*  
**THE QUALITY  
SPARK PLUG**

International Trucks and Tractors, Allis-Chalmers Tractors; Diamond-T, White, GMC, and Chevrolet Trucks; Chevrolet, Pontiac, Packard, Oldsmobile, Nash, Buick, Cadillac and La Salle motor cars—these are some of the well-known tractors, trucks and cars which use AC Quality Spark Plugs as standard equipment. Trust your spark plug requirements to the same brand of spark plugs which the leading, big-volume manufacturers select.

COMMERCIAL CAR JOURNAL  
JUNE, 1939



## DO THESE THREE THINGS and You'll Get Complete Satisfaction

- 1 Standardize on the right *make*.
- 2 Select the right *Heat Range*.
- 3 *Clean and regap* all plugs every 3,000-4,000 miles.

Fleet experience, representing millions of miles, shows that best spark plug service is assured this way.

AC's 30 years of experience assure you of satisfactory spark plugs—year in and year out.

When engine conditions are normal, the *specified* AC type gives uniform satisfaction. When those conditions are not normal, the AC Heat Range (most complete in the industry) provides the satisfactory solution.

When it comes to cleaning and adjusting, the new, improved AC Cleaner gives you faster cleaning with less compound per plug, and the AC round wire gap gauge assures real accuracy in gap setting.

This is "the answer" when it comes to spark plugs. And it means good engine performance... long plug life... freedom from service interruptions.

**NEW, IMPROVED**  
(Model "C")

## AC PLUG CLEANER

Size 12" x 24"... cleans faster, better, and uses less compound... dual valve control, cleans and dusts in one operation... no flying dust... adapters automatically locate plugs for best cleaning results... available with or without stand.

**See Your AC Supplier**



AC SPARK PLUG DIVISION • General Motors Corporation • FLINT, MICH.

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(CONTINUED FROM PAGE 64)  
 which we can help our drivers "to eliminate personal worries." As stated, we require annual physical examinations by our Store physicians, to lessen the health worry. At the beginning of our reorganization program we called a meeting of all drivers, to let them know that I would be at the garage every day, beginning from their starting time in the early morning to their quitting time, and that I would be only too glad to take up with them any personal or

business problems that might confront them. I figured that when a chauffeur or extra driver is thinking about his personal difficulties, he can't be safety minded.

Our chief method of financial aid, when that is needed, is through our Store credit union. Nearly all our drivers and helpers have accounts, built up through authorized weekly pay deductions varying from 25 cents up to several dollars. The maximum credit deposit is \$350. A small interest charge is made on loans, which

may be returned in weekly payments; and there is an interest allowance on surplus deposits. A driver whose credit has been established thus can get a loan quickly, up to several hundred dollars. We feel that this agency has been of great importance, helping drivers to reduce money worries and keeping away from "loan sharks."

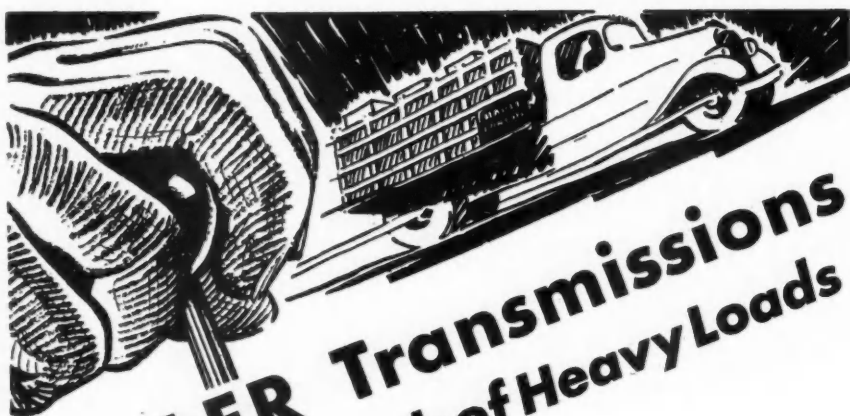
Another method of reducing driver worries has been through the installation of small cash-deposit safes in most of our delivery trucks. This change has more than paid for itself, since we formerly were paying out as much as \$170 some months for "money orders," purchased at suburban post-offices by drivers who had collected large sums from C.O.D. orders, as a precaution against the frequent holdups of such drivers three years ago. Our drivers perhaps were especially marked by such hold-up men, because from 45 to 70 per cent of their deliveries are C.O.D. orders. Thus, it is not uncommon for a driver to collect \$200 to \$500 in a day. Our reorganization remedy was the installation of small safes, fastened with wide steel straps and large rivets to the foundation beams of the truck. The safe is so constructed that money (or even a pay check about which the driver might become nervous) can be dropped in and then cannot be removed. Since then there has been only one attempted C.O.D. robbery. The would-be hijacker was told to read the sign on the safe, stating that the truck driver had no key to the safe; and one kick at the safe convinced him that the safe was too solid for easy removal.

#### Monthly Safety Meetings

Our drivers are trained in our monthly safety meetings to the effect that they never get anywhere by permitting themselves to get into a traffic argument with anybody—with another driver, a pedestrian, or a policeman. This is a part of our training in "road courtesy." We tell our drivers that if another driver wants to pass in a hurry, let him do it.

"And maybe," I sometimes add, "he will be in the hospital while you're still driving. Nothing is gained," I continue, "by trying to bluff anybody when you find yourself in traffic trouble. Don't bluff, apologize, or explain. Keep calm and courteous. Give them your number

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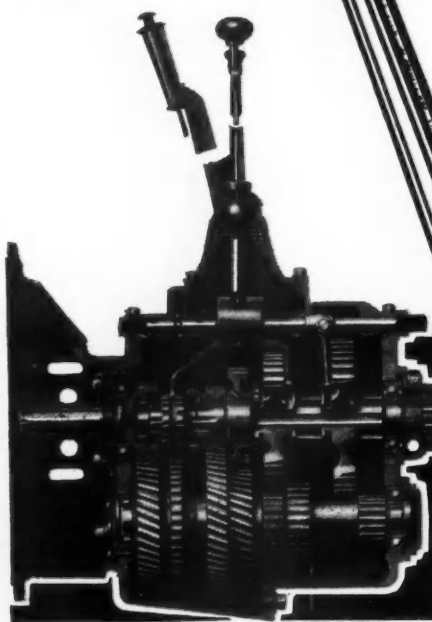


## FULLER Transmissions Make Light Work of Heavy Loads

MODELS 5A43 and 5A430  
 —A quality unit for heavy duty trucks and tractors. Five speeds forward and either one or two reverse. Option of overdrive or direct on fifth. Three quiet driving speeds.

On countless tough trucking jobs, FULLER Five-Speed Transmissions have helped to speed up schedules and reduce operating costs. They provide a gear ratio for every road and load. They reduce wear and tear on motor and operator. Their stamina and durability insures more service with less servicing. Specify FULLER Five-Speed Transmissions and haul more pay load per dollar of cost!

Fuller Mfg. Co., Kalamazoo, Mich.



# FULLER

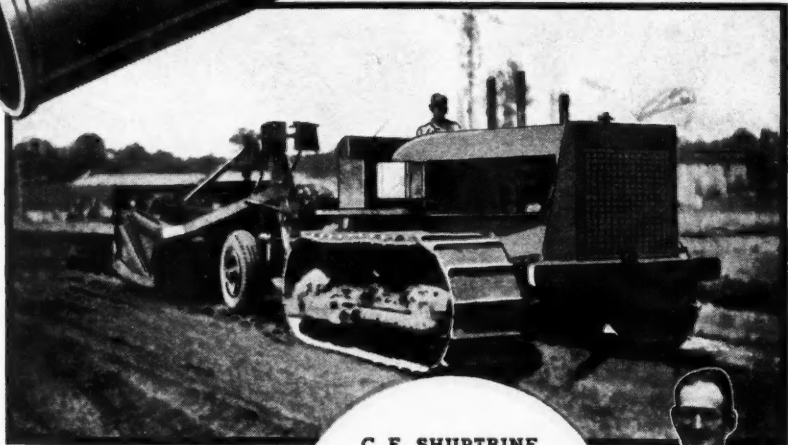
FIVE-SPEED  
 TRANSMISSIONS





"In all our experience we have never seen anything to equal the service given by this set of Nitricastiron Cylinder Sleeves."

(Signed) A. V. SMITH  
Shuptrine Construction Co.  
McComb, Mississippi



C. E. SHUPTRINE  
says:

We agree with our master mechanic when he said, "These sleeves are an answer to a contractor's prayer!"

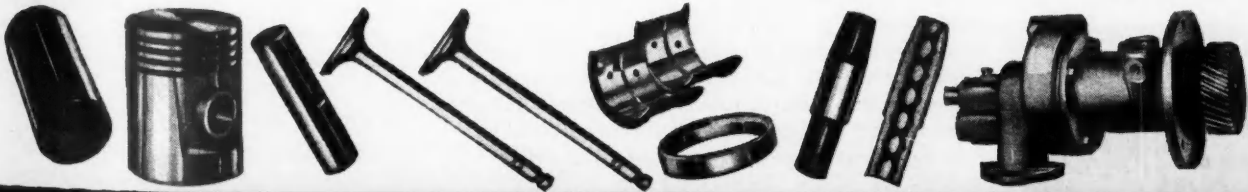
"We installed a set of Nitricastiron Sleeves in our Model "L" Allis-Chalmers tractor in March, 1938. This tractor has worked night and day 60% of the time since. So when we tore the motor down this week these sleeves have seen service for an average of a year and a half. We found these conditions:

Piston and Wall Wear . . . . . practically none  
Ring . . . . . good enough to put back in  
Connecting Rods . . . . . took out one shim in each rod  
Oil Consumption 1 to 2 quarts in 10 hours of hardest use."



These are the Thompson Heavy Duty Parts which convert ordinary engines into super power plants for super service: Nitricastiron Cylinder Sleeves, Aerotype Pistons, Chrome Plated Piston Pins, Aerotype Valves, Duracrome Valve Seats, Graphited Valve Guides, Packless Pumps.

THOMPSON PRODUCTS, INC. • Cleveland • Detroit



# Thompson Products

(CONTINUED FROM PAGE 66)

and name; tell them you're sorry and promise a fair settlement for any damage done . . . Then get back and tell us all about it as soon as possible."

This same training in driver courtesy—not talking too much and keeping calm—has helped us to bring a large reduction in the reports of customers about "driver discourtesy," when there are misunderstandings in the delivery of goods. "The less you say," I tell them, "the better.

If you say nothing—nothing at all—they certainly can't accuse you of discourtesy!"

We try to develop real safety comradeship with our drivers—prove to them that we are really interested in their individual safety records. Each month we post a list which includes a condensed safety record of all our regular drivers, listed in the order of longest no-accident periods. For instance, our last monthly report shows that E. Treacy began as a chauffeur on Nov. 24, 1924; that he has driven

for 6 years and one month without an accident, covering 155,307 miles; and that he has No. 1 no-accident rank both in length of time and miles. This list also shows 8 drivers who have driven more than 6 years without an accident; 5 who have driven over 5 years; 5 over 4 years; 12 over 3 years; 9 over 2 years; 10 over 1 year; and 8 with no-accident records of from one to 11 months. It is becoming more and more a matter of pride among our drivers to see their names gradually crawl higher and higher toward the top of this monthly list.

We hold monthly safety meetings, frankly talk over our most recent fleet accidents, and new problems in accident prevention. We use every opportunity to honor the men with the best safety records, in the presentation of annual awards at our annual banquets and at other like special meetings.

It may be interesting at this point to note the nature of the 12 chargeable accidents, listed in the order of their occurrence, which were reported by our drivers during the 12 months of the last annual safety contest:

1. Driver backed into a bus which was unobserved by his helper.
2. Driver turned at intersection and was unable to avoid collision with approaching cab.
3. Driver backed from service station into approaching truck, not hearing any warning from his helper.
4. Driver going slowly, looking for house number, was hit by truck backing from a driveway.
5. Driver turning right at intersection, struck fender of a light car attempting to pass.
6. Driving through an alley, truck bumped into a car being driven along an intersecting alley.
7. Truck, driving away from a curb, was struck in rear by a car stopping at the curb.
8. Driver, emerging from viaduct, was unable because of icy street to prevent slight collision with another truck which started to cross street directly in front.
9. Driver, thinking another car intended to let him pass at intersection, bumped into it.
10. Driver, observing packages sliding from truck, turned toward curb, but icy street caused sliding into another car.
11. Driver, attempting to park

(TURN TO PAGE 70, PLEASE)



## Prompt Service through National Distribution

**E**VERY red dot on this map shows a sales and service organization which, in effect, brings Handy factory service to every truck owner in its compact, surrounding region.

These Handy Distributors are specialists. Most of them have sold and serviced Handy Governors for many years.

Your Handy Distributor will give you expert counsel and prompt experience service. He carries a full stock of all Handy products.

Ask your Handy Distributor about the new Handy Visible Governor, the sensational model you can inspect at a glance for operation and condition. And remember—Handy is the Governor sold AND SERVICED IN YOUR TERRITORY.

### HANDY GOVERNOR

Division of King-Seeley Corporation

World's Largest Builder of Automotive Governors

**HANDY**

*Visible  
Action*

**GOVERNORS ...**

# BORDER TO BORDER COAST TO COAST



## THIS NEW TYPE SPARK PLUG CUTS COSTS FOR BUS OPERATORS

ONE of the surest ways to slash maintenance and operating costs is to switch over to Auto-Lite Spark Plugs. Tests, conducted under actual operating conditions by bus and truck operators, convincingly demonstrate this new kind of spark plug definitely saves them money two important ways.

Auto-Lite Spark Plugs are more durable—last longer in service—and they improve gasoline economy by preventing gasoline waste.

These two qualities are due primarily to the new Ziramic insulator and Konium Electrode—two developments of Auto-Lite research engineers that mean money-in-pocket to every one who has to keep transportation rolling at low cost.

The Konium Electrode, together with Auto-Lite "geometric" gap design, makes

it possible to produce a more effective, more certain spark with less effort. And Ziramic, the new improved insulator material, resists heat, electrical and mechanical shock as no other insulator ever has.

From Border to Border and Coast to Coast this sensational new Auto-Lite Spark Plug is cutting operating costs for bus and truck fleets. Write to The Electric Auto-Lite Company, Merchandising Division, Toledo, Ohio, for Special Fleet Contract details today!

# AUTO-LITE SPARK PLUGS



(CONTINUED FROM PAGE 68)

ahead of another car, slid on wet pavement and scratched fender of other car.

12. Driver, unable to stop in time when oil truck stopped in front, damaged his truck.

We have made great effort to aid our drivers by keeping our trucks in good condition for safe driving. As stated, nine-tenths of our trucks are more than ten years old and have two-wheel brakes. We have tried to compensate by training our drivers

to more careful driving habits. Another compensation has been extra booster brakes on some of our trucks. All of our brakes of course are tested twice a year when they pass through the compulsory Chicago "safety lane." In addition, we test them once a month with a "decelerometer" which we use either on our garage floor or outside in a suitable place.

We also make a specialty in the care of our tires. We have an individual record card for each tire, and retread some of them 4 or 5 times.

There has been a double reward. First, tire failures on the road are almost unknown to our drivers; and this undoubtedly has great safety importance. Secondly, our 1938 report shows that our tire mileage cost was only two mills per truck mile or four-tenths of a mill per tire mile.

At the beginning of our reorganization program we established a thorough system of garage inspection. We now have four such inspectors and expert mechanics, whom we consider an essential part of our safety program. They are expected to attend all driver safety meetings and their pictures are taken with all group safety pictures of our drivers.

Every night each driver reports any observed mechanical fault in his truck. These reports are followed up each night by our garage mechanics and the minor faults are corrected immediately. In addition, each truck is inspected nightly for tires and for greasing; and every third day each truck receives a more complete inspection. The repairs of each truck, and all new material and appliances put on it, are tabulated on a special individual truck form originated by our department. Thus we keep a complete record on each truck, with operation costs classified in detail.

A further fact of importance is that we have in our garage an expert body maker. During recent years he has supervised the making of all our truck bodies. He keeps all truck bodies in repair, and during other times he and his assistant are at work on new bodies. Thus we have been able to build a number of original safety and utility features into these bodies, including conveniences and changes suggested by a certain driver scheduled to use a new body. For instance, a more comfortable seat; and new inside loading helps.

As stated, we consider the "human element" most important in our fleet safety and efficiency program, hence wish to keep in close touch with the desires and needs of our drivers.

#### Battery Troubles?

How a battery is constructed, how it produces electrical energy, what makes it break down, how to get the most out of all available tests—all this and more is contained in a new book, "An Easy Way to Get at Battery Trouble!" just published by Battery Book, 600 S. Michigan Avenue, Chicago. Cartoons and colored drawings add spice and information. It's yours for two bits. Just address the publisher.

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JUNE, 1939

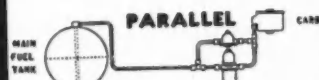


... and you're on it!

#### INSTALLATION IS SIMPLE AND EASY



Mount in cool convenient spot along fuel line, below carburetor, and close to fuel tank as possible so fuel is mainly pushed.



Operates perfectly as auxiliary to cam pump—cutting in automatically when cam pump needs help; otherwise lies idle. No cut-off valves needed.



Both pumps work all the time. Not so good as parallel hook-up, but often a convenient and effective vapor-lock remedy.



Connect twin tanks with one line looped for flexibility; fuel will feed evenly from both. Keep Autopulse below the carburetor always.

In the good old summer time, (Oh yeah) when fuel troubles come along and vapor lock is constantly causing expensive tie-ups, you men who are responsible for uninterrupted schedules are really "on the spot."

—Unless of course you are one of those wise operators who have equipped EVERY unit with Autopulse.

#### AUTOPULSE Ends Fuel Waste and Vapor Lock

There is no vaporized fuel passing out the carburetor vent, or bubbles backing up down the fuel line to cause vapor lock when Autopulse is "on the job."

Mount it away from the motor where it pushes COOL FUEL in a solid steady stream.

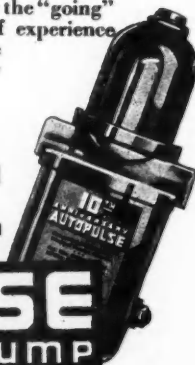
Smart operators the country over, standardize on Autopulse wherever the "going" is really tough, for years of experience has proven that Autopulse never fails to do the delivery job. Write—

AUTOPULSE CORPORATION

2821 Brooklyn Avenue

DETROIT • MICHIGAN

**AUTOPULSE**  
ELECTRIC FUEL PUMP



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## ... AND STILL GIVE IT, TOO!

Construction trucks, wallowing in and out of hub-deep mud, soaking their brake blocks with muddy water, stopping fully-loaded on sharply-inclined ramps—these are tests to try the endurance of any brake blocks and Grey-Rock *can take it*.

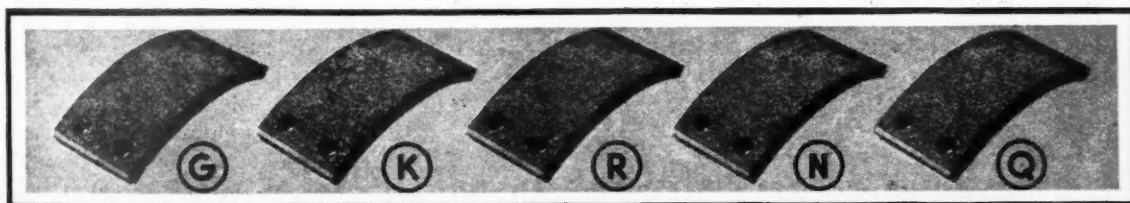
But when those same trucks get out on the open highway and roll along with throttles open, Grey-Rock can *give*, too—give the sure, certain, smooth, balanced stops that safety demands.

Your Grey-Rock jobber backed by factory field engineers can balance the brake action, reduce brake maintenance costs and increase the brake lining life on any fleet operation. These men have at their command the Grey-Rock Balanced materials for light or heavy trucks:

★ For **HEAVY** Trucks using BOLT-ON Blocks, Grey-Rock has five different types (G K R N Q) with varying characteristics to control wear, stopping power and heat checking, or scoring of drums. These blocks are available in *factory-combined* sets to handle toughest operating conditions. Where unusual operating conditions exist, Grey-Rock field engineers make an on-the-spot analysis and recommend special factory-combined sets.

★ ★ For **LIGHT** Trucks Grey-Rock has two Blocks—GREY-ROCK BLOCKS, *homogeneous, rigid molded* with medium friction (orange edges), and HiWaY BloX, *hydraulic compressed, rigid woven* with higher friction (black edges). When used as directed by Grey-Rock engineers in the Recommendation Guide, they will balance the brakes on any vehicle using RIVET-ON Blocks.

Yes, Grey-Rock can take punishment and give service. Regardless of the make, model, year or operating conditions in your truck fleet every problem can be solved by Grey-Rock's specialized materials.



★ For **HEAVY** Trucks these 5 Bolt-On Blocks  
in Factory-Combined Sets



★★ For **LIGHT** Trucks  
these 2 Rivet-On Blocks and  
the Guide

# BALANCED TRUCK BLOCKS

of Raybestos-Manhattan, Inc., MANHEIM, PA.

BRAKE LININGS • CLUTCH FACINGS

## DYNAMOMETER

(CONTINUED FROM PAGE 35)

proven the economic value of thorough acceptance tests combined with tune-ups of all new equipment. This work is done by the same shop section that handles routine tests of older operating equipment. Standard factory instructions which are required with each piece of equipment are used in determining adjustments.

Complete acceptance tests includ-

ing full load performance will reveal deficiencies that might escape attention in normal operation until months later when unusual maintenance costs are checked back against the vehicle as a matter of routine. It is then rather late to effect any adjustment under a guarantee.

This matter of acceptance tests is important for it not only assures guaranteed performance but has also proved to be of unusual value in determining standards for new car performance which may be used as a

goal in later reconditioning or in specifications for other purchases.

The chassis dynamometer is an advanced type of tool in the "tune-up" kit. Those fleets equipped with full power chassis dynamometers report consistent savings through load test performances which quickly prove efficiencies or deficiencies in the equipment under test.

L. L. Beardslee, superintendent of shops and garages for the county of Los Angeles, has formed the following conclusions after extensive use of a chassis dynamometer:

"By the use of the chassis dynamometer we are able to more closely diagnose the ailments of the modern, high-speed, high compression, very often irritable automobile.

"The dynamometer not only duplicates road conditions, but is able to exaggerate them to such an extent that conditions not apparent to the operator of the vehicle will often show up under test.

"For instance, a fuel pump that will not furnish sufficient gas to operate at 60 m.p.h. wide open throttle, would tend to vapor-lock under operating conditions. Likewise an ignition system that is not functioning properly will show up under the same test.

"Spark plugs that are cracked or worn, or not of the proper heat range, will show their condition more readily on the dynamometer than on the road because we can maintain any throttle or load condition indefinitely.

"Carburetor adjustments under various speeds and loads are easily made with the additional use of the Exhaust-Gas Analyzer and Vacuum Gauge. Cruising mixtures can be set for each individual car, depending on where and how it is operated. No two engines of the same make and model will operate to their best ability on the same carburetor or ignition adjustments. This condition is very apparent by the use of the chassis dynamometer.

"Using the dynamometer we are able to regulate the size and the 'coming-in' time of the step-up or power jet. This is a very important item as so much depends on the power jet. It has been found that by enlarging or reducing the size of this jet we have been able to increase the horsepower output of the engine as much as ten per cent.

(TURN TO PAGE 78, PLEASE)

# Announcing-

## THE

# LEIBING DEGASSER

### FOR BUS AND TRUCK FLEETS

**ELIMINATES  
MONOXIDE EXHAUST  
GASES · CUTS FUEL COSTS  
PREVENTS MANIFOLD  
LOADING · IMPROVES  
ACCELERATING  
ACTION**



At last—a time-proved, automatic vacuum-controlled device which shuts off the fuel at the idling jet—every time the motor is decelerated! Actuated by the excessive vacuum which ordinarily sucks a heavy charge of fuel into the manifold at every decelerating operation, the LEIBING DEGASSER positively eliminates poisonous monoxide gases and exhaust fumes—right at the source. It cuts fuel costs . . . reduces crankcase dilution . . . prevents manifold loading . . . aids accelerating action. Repeated tests show fuel savings ranging from 12% to 27%—zero readings on carbon monoxide gas—drastic reduction of nauseous aldehydes.

Several hundred bus and truck fleets are now using the DEGASSER—a real boon to passenger operation—a thrifty aid to lower ton mile costs. Illustrated descriptive folder will be sent on request.

#### NOTEWORTHY FEATURES

1. Vacuum action automatically operates diaphragm. 2. Idle jet fuel flow instantly shuts off whenever motor is decelerated. 3. Perfect idling condition instantly restored when deceleration is ended. 4. Is tamper and foolproof and built into carburetor for matched performance.

### LEIBING AUTOMOTIVE DEVICES INC.

Manufacturers of Governors and Degassers

Detroit, Michigan

**ELIMINATES *All* EXHAUST GAS FUMES**

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COMMERCIAL CAR JOURNAL  
JUNE, 1939





## A Lighter Chassis Hauls 935 Gallons More—

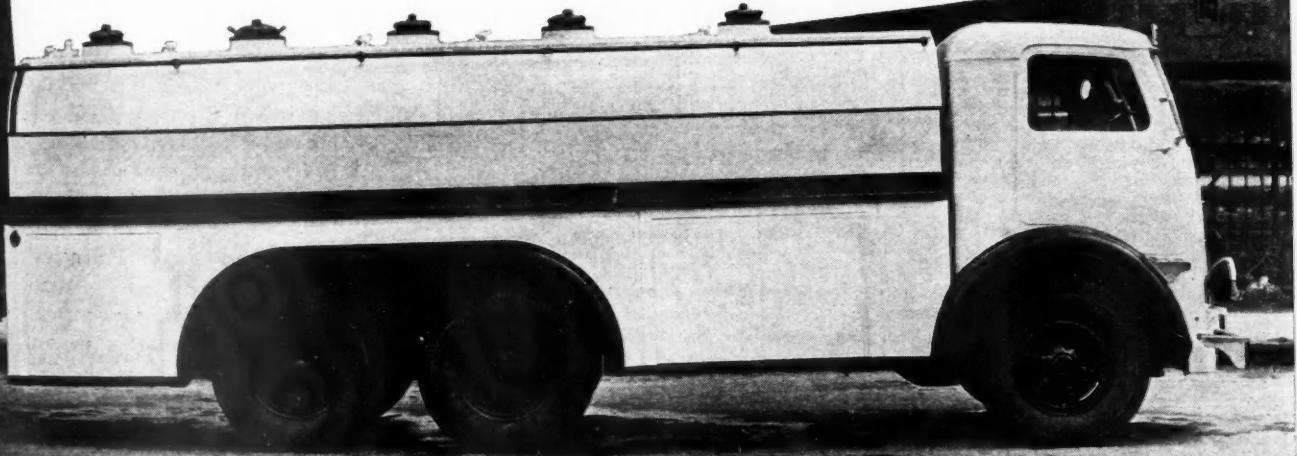
"We are not able to determine the exact savings in weight of this tank over the tank it replaced. We can say this: Our first semi-trailer had a 2863 gallon tank and this was the maximum we could haul and stay within the 40,000 lb. limit. Our new job is fabricated with Republic Double Strength Steel and has a capacity

of 3800 gallons. This unit, too, is within the 40,000 lb. gross weight limit. We must amplify the statement by saying the new job does have a lighter semi-trailer chassis and this accounts for part of the increased tank capacity. However, it would hardly be possible to use a lighter chassis if we had used the regular steel tank."

## This Could Have Been 1300 Pounds Lighter—

The Tank itself was built of Republic Double Strength Steel, but not the side-carried boxes, and is 480 lbs. lighter than a duplicate in mild steel while carrying the same number of gallons. If the carrier boxes had been built of Republic Double Strength Steel, an additional saving in weight of

420 lbs. would be effected, or a total of 1300 lbs. The total weight of the steel tank is 6,570 lbs. while the Republic Double Strength Steel tank weighs 5,270 lbs. Both carry 2400 gallons of gas. 13 gauge shell sheets and 12 gauge head sheets of Republic Double Strength Steel were used.



## Other REPUBLIC STEEL Products used by the Automotive Industry

Alloy Steels — ENDURO® Stainless and Heat-Resisting Steels — Carbon Steels — Copper-Bearing Steel — Toncan® Iron — Silicon Steels — Pig Iron

Sheets — Strip — Plates — Hot Rolled and Cold Drawn Bars — Pipe — Tubing — Bolts — Nuts — Rivets — Wire — Welding Rod — Boiler Tubes

Reg. U. S. Pat. Off.

(CONTINUED FROM PAGE 74)

"Irregularities in the ignition system, especially in governor and vacuum advance characteristics, are easily found and remedied. The cut-back of the vacuum spark control and the coming-in time of the carburetor power system can be balanced to eliminate any roughness or flat spots at this very critical point.

"By varying the load and throttle opening we are able to show up carbon deposits so plainly that in some cases the engine will operate just as

well with the ignition switch off. This can be done very quickly because we are able to feel out the spot where the engine tends to 'ping' most.

"Any unusual vibration such as worn universal joints or crooked drive shafts are easily discernible.

"Noises emanating from the rear of the car are easily classified. A tire hum or rumble takes on an unmistakable sound on the rolls of a dynamometer. A sound that is actually in the rear axle housing cannot be mistaken.

"Eccentric wheel or tire conditions will make themselves known without any effort on the part of the operator.

"Our method of procedure is designed to find and classify troubles quickly. As yet we have attempted no extensive or involved engineering. We cannot tie up our equipment too long, so we must locate and remedy the troubles quickly. In this type of equipment dependability is most desired.

"We have quite a number of 1937 cars with over 100,000 miles. Many of our 1938 cars have been driven from 60,000 to 70,000 miles. Most of these cars are in 24-hour service, some having as many as six different drivers in 24 hours.

"When the car is placed on the dynamometer, a vacuum-gauge and exhaust-analyzer are connected. The car is then tested under part load at 20, 40, and 60 m.p.h. When the 60 m.p.h. test is completed, the load is increased until the throttle is wide open at 60 m.p.h. Horsepower and carburetor readings are taken at this point. The test is duplicated, and readings taken at 40 and 20 m.p.h.

"The part load test shows cruising mixtures.

"The full load test shows power mixtures and horsepower readings, as well as any irregularities, such as sticky valves and faulty ignition.

"If carbon deposits are present, the engine will have a persistent 'ping' at 20 m.p.h. under this test. A further test to verify this symptom is to turn off the ignition switch momentarily during the most severe 'ping.' If the engine continues to run with switch off, it indicates that incandescent carbon or cracked spark plug is furnishing 'self-ignition.'

"At the completion of these tests, the engine is shut down and necessary adjustments are made. At the same time compression, starter, cooling system, and accessories are inspected.

"After necessary repairs have been made, it is advisable to retest in the above procedure."

C. B. Lindsey, Superintendent of Automotive Equipment, Los Angeles Railway Company, has illustrated the use of the chassis dynamometer with a set of power curves Nos. 1 to 6 inclusive. He states:

"I am going to attempt to show by graphs some of the conditions which affect the horsepower and fuel con-

(TURN TO PAGE 82, PLEASE)

NOW YOU CAN CUT FUEL, OIL, REPAIR EXPENSE

AS MUCH AS 25%

BY OPERATING TRUCKS IN  
THE ECONOMY RANGE



with the new  
**STEWART-WARNER**  
MOTOR MILE TACHOMETER

EVERY truck has an **ECONOMY RANGE**—a certain range of r.p.m. within which it operates at maximum torque, horsepower, and road-speed efficiency consistent with fuel economy. Above that range, overspeeding occurs—a short cut to early motor death. All truck manufacturers warn against overspeeding. Below that range, "lugging" results.

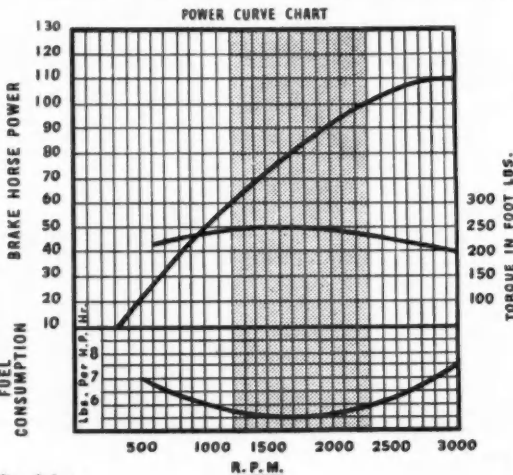
NOW, with the amazing new Stewart-Warner Motor Mile Tachometer, it is possible for the driver to know the **ECONOMY RANGE** of his truck—and to keep his engine speed always within that range! Two red pointers are permanently set at the upper and lower limits of this range. The driver merely needs to keep his tachometer pointer between those two red pointers—and you save up to 25% on your fuel and oil expense!

#### Records Motor Miles for Accurate Servicing

More than that, this utterly new kind of tachometer not only shows engine r.p.m., but records them in terms of "motor miles"—the only safe basis for engine service. Thus the added "motor miles" which your motors pile up traveling in low gear—or while your engines idle during a long stop—are truly recorded. Servicing your trucks on this basis can save as much as 25% of your repair bills! Mail the coupon for complete details.

**STEWART  
WARNER**  
MOTOR MILE  
TACHOMETER

STEWART-WARNER CORPORATION  
1876 Diversey Parkway • Chicago, Ill.



Graph Shows Economy Range

In determining the economy range of a truck, brake horsepower is recorded at all operating speeds. So also is the torque. Fuel consumption is likewise carefully computed. In this particular case, the range of engine speed between 1200 and 2300 r.p.m. proves to develop the most power with the lowest fuel consumption, and is, therefore, the **ECONOMY RANGE**.

STEWART-WARNER CORPORATION Dept. F  
1876 Diversey Parkway, Chicago, Illinois

Please give me all the facts about cutting truck operating costs with the new Stewart-Warner Motor Mile Tachometer. I operate.....trucks.

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COMMERCIAL CAR JOURNAL  
JUNE, 1939



# WHERE ELSE COULD YOU FIND SO MUCH TAPERED ROLLER BEARING KNOWLEDGE AND EXPERIENCE ?

The Timken Roller Bearing Company pioneered the tapered roller bearing. We have been manufacturing and applying these bearings for more than 40 years. During this time upwards of 450,000,000 TIMKEN Bearings have been applied to automobiles, motor trucks, tractors, trailers and all kinds of industrial machinery. Our service connections have available bearings of all sizes to fit these many types of equipment even though some of them may be obsolete.

TIMKEN Bearings are dominant on (a) steel mill roll necks where bearings are required to support loads running into millions of pounds; (b) machine tool spindles where extreme precision is required; (c) American railroads where an overwhelming majority of new locomotives, passenger cars and streamlined trains are equipped with these bearings.

99% of all makes of automobiles, trucks and buses use TIMKEN Bearings at one or more points.

## **TIMKEN** *TAPERED ROLLER BEARINGS*

**THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO**  
**Service-sales Division**



(CONTINUED FROM PAGE 80)  
sumption of our engines in service. All of these curves were made from one of our engines, the various units being purposely thrown out of adjustment to duplicate the condition usually found on engines reported for low power or excessive fuel consumption.

"Curve No. 1 shows the effect of a partly closed choke. The top curve in each chart shows the maximum horsepower at the rear wheels of the vehicle in normal condition. As

shown by the lower curve, there is a loss of 6 per cent in maximum horsepower caused by the over-rich mixture. This condition also caused an 11 per cent rise in fuel consumption.

"In curve No. 2 we have the effect of a retarded spark. Although it is probable that this condition would not be detected under ordinary operating conditions, we find a loss of 8 per cent in power and 15 per cent increase in fuel consumption.

"Curve No. 3 shows the effect of a broken spark plug wire: 19 per cent

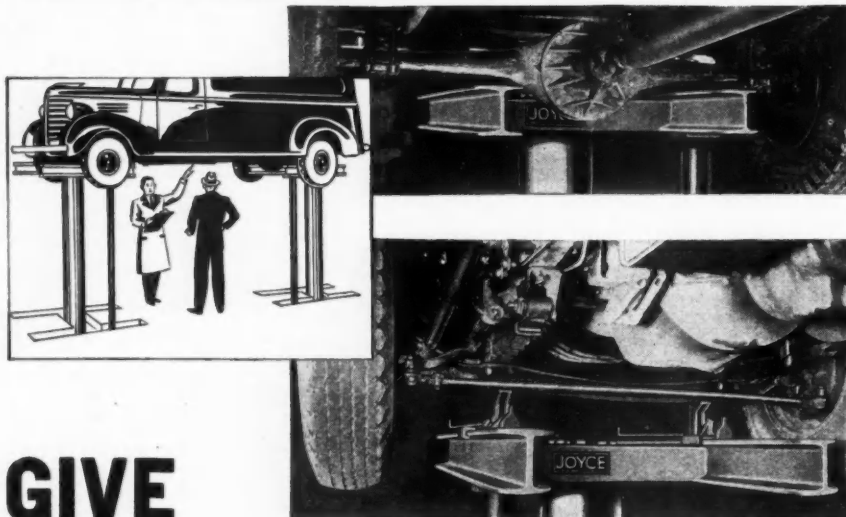
power loss and 28 per cent increase in fuel consumption.

"Curve No. 4 shows a slight leak in the intake manifold; 8.5 per cent power loss and 5 per cent increase in fuel consumption.

"Curve No. 5 shows the effect of late valve timing; power loss 7 per cent and fuel consumption increased 4 per cent.

"Curve No. 6 shows that governor incorrectly adjusted can easily cause this 34 per cent power loss and 25 per cent increased fuel consumption."

## JOYCE BUS and TRUCK LIFTS



## GIVE YOU THE WHOLE PICTURE

... at a glance ... of the service parts of your fleet. And with every vital spot in the clear ... with lots of head room and arm room ... it's no wonder your mechanics do better work, more thoroughly and safely and at much less cost.

It's a simple matter to drop drive shafts, transmissions or pancake engines ... to check springs, steering gear or wheels ... if you have a JOYCE Two-Post Lift with divided superstructure.

And only in JOYCE Lifts can you find that combination of an extra-long genuine bronze guide-bearing, seven layers of Chevron packing, and a water-tight wiper ring to take the wear and strain of off-center loads without binding or leaking.

Joyce makes the world's largest line of Bus and Truck Lifts. To get the most practical and economical installation for your fleet consult our experienced engineers.



THE JOYCE-CRIDLAND CO.  
Dayton Ohio

# JOYCE

The Joyce-Cridland Co.  
Dayton, Ohio  
Send me your new Bus and  
Truck Lift Bulletin:

Name .....

City .....

## TOLL ROADS

(CONTINUED FROM PAGE 31)

needs of growing peace-time traffic.

2. The modernization of the Federal-aid highway system with the Federal Government paying a greater share of the cost.

3. The elimination of hazards at railroad grade crossings.

4. An improvement of secondary and feeder roads, properly integrated with land-use programs.

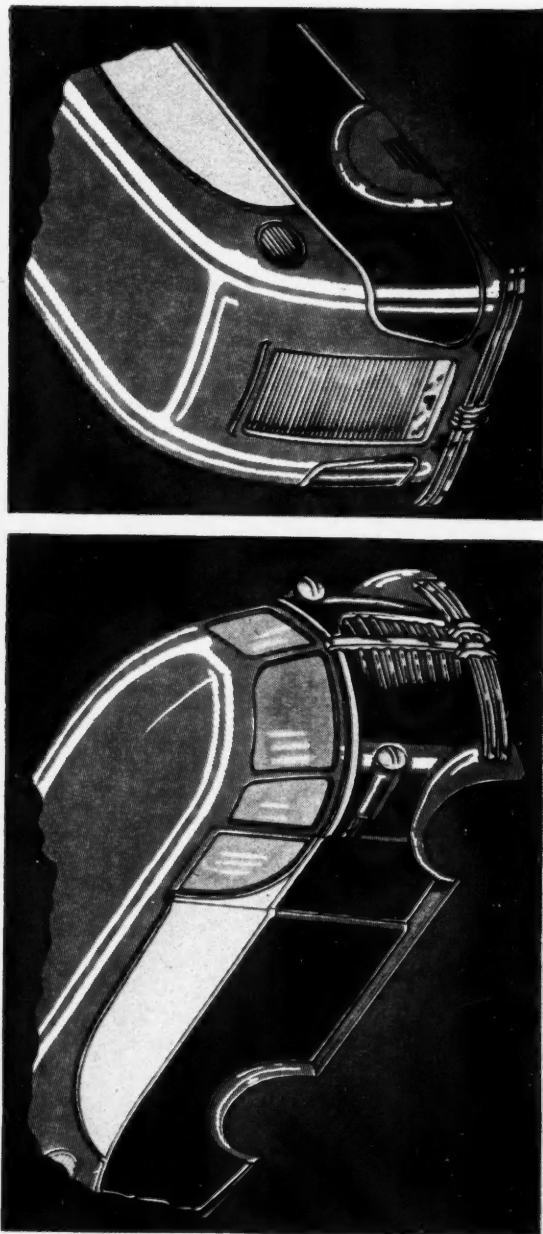
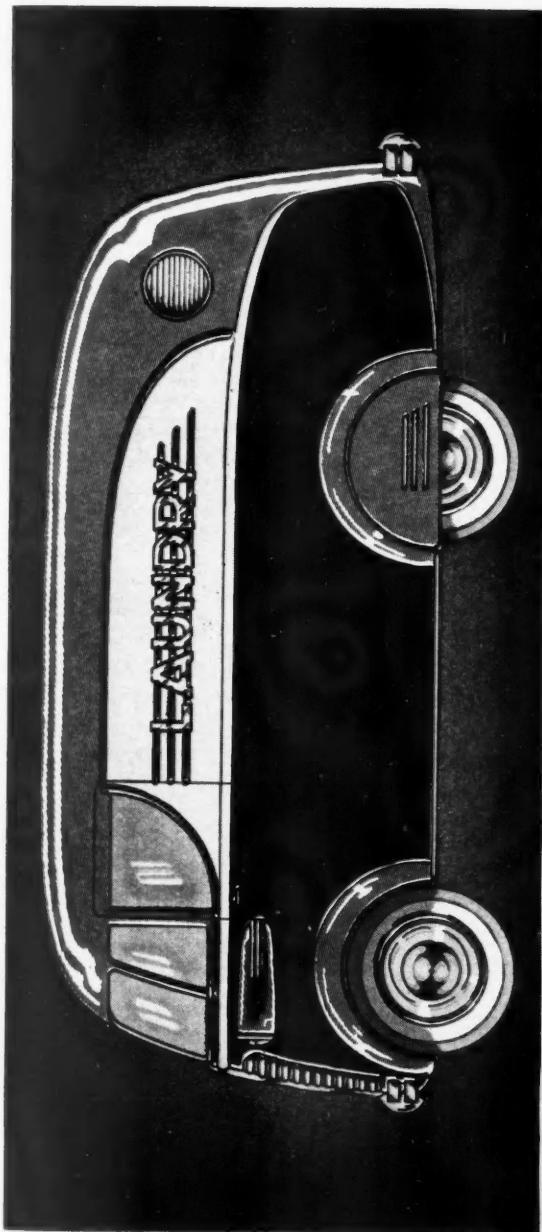
5. The creation of a Federal Land Authority empowered to acquire, hold, sell, and lease lands needed for public purposes and to acquire and sell excess lands for the purpose of recoupment.

White House interest in the recommendations immediately prompted reports that the New Deal is preparing to adopt the Bureau's plan as an Administration measure. Such strategy dovetails with President Roosevelt's proposal to reorganize Federal administrative machinery, under which the Bureau of Public Roads would be removed from the Agriculture Department's jurisdiction and its functions, including the allocation of funds to the states under the Federal Aid Highway Act, transferred to a new Federal Works Agency together with PWA, WPA, and other agencies whose principal jobs involve construction.

Mr. Roosevelt has referred at least once to the possibility of putting WPA labor at work building super-highways and he has also touched briefly on the national defense angle. In his message to Congress accompanying the report, he referred specifically to the question of taking ex-

(TURN TO PAGE 84, PLEASE)

# THE COLORS OF THE MONTH FOR THE BODY OF-THE-MONTH\*



**WHAT'S** color to the fleet operator? Dollars and cents! There's a best color combination for your fleet. One that will identify your company, give added appeal to your products, make your fleet sell as well as deliver, win favorable attention, convert your painting dollars into profit dollars by making each unit an effective traveling advertisement. The correct use of colors can also increase visibility and safety—cut operating costs. What colors and where? Make The S-W Transportation Color Service your source of authority. It's free!—part of the "plus" value in the No. 1 Finish in Transportation—Kem Transport Enamel. Write The Sherwin-Williams Company, Cleveland, Ohio, and principal cities. No obligation.

## \*COLORS-OF-THE-MONTH

Again the S-W Transportation Color Service cooperates on Commercial Car Journal's outstanding "Body-of-the-Month" feature. Recommended colors for the Laundry fleet are: Kem Transport Enamel Export Blue No. 43215. Export Blue tinted with white. Kem Transport Blue-white No. 43050.



**SHERWIN-WILLIAMS  
KEM TRANSPORT ENAMEL**

(CONTINUED FROM PAGE 82)

cess lands for road development and re-selling at a profit—a subject he has mentioned before when discussing the highway issue. He talked more at length on this phase of the problem than any other in his highway message.

Aftermath to the report on Capitol Hill indicated that committees in both Houses were laying plans to carry the program into action.

"It's too big a problem for the individual states to handle," said Rep-

resentative Cartwright, ranking member of the House Roads Committee and author of several highway bills introduced in former years. "My bill would provide for an Authority which would have the same power of operation as the TVA (Tennessee Valley Authority) to proceed under the right of eminent domain, with a national program."

Said Representative Snyder, Democrat of Pennsylvania, who has introduced three super-highway bills in as many sessions:

"The Bureau proposes to construct inter-regional highways. I speak of them in my bill as transcontinental highways. The general principles involved in both plans are the same; except I would have the roads constructed in straight lines to avoid cities wherever possible."

Other super-highway advocates in Congress declined comment, insisting that time had not permitted them to read the comprehensive report. None would concede that pending super-highway measures have been relegated further to the background as a result of the Bureau's painstaking analysis.

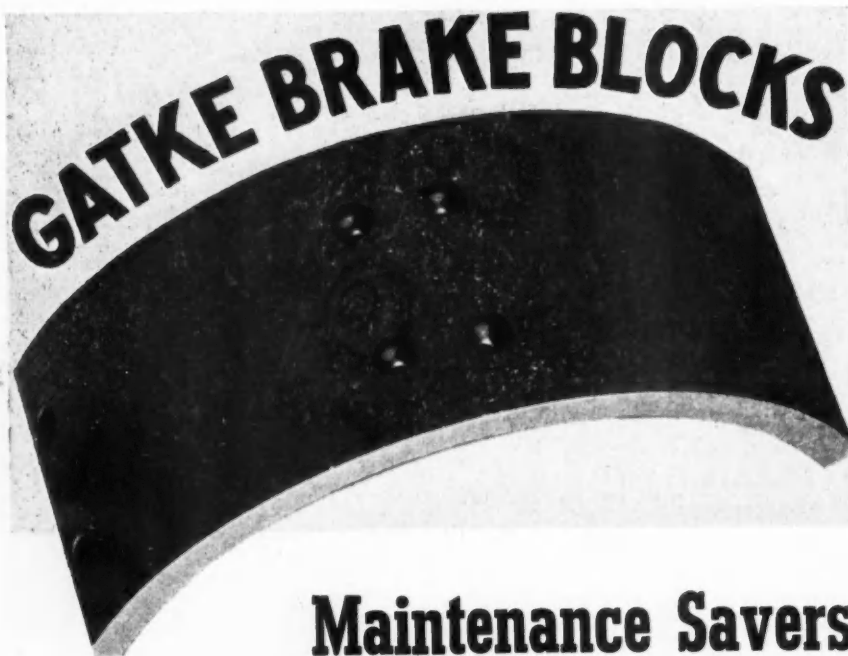
Before turning thumbs down on the toll-road idea, the Bureau of Public Roads studied all angles of the problem, submitted tentative locations for three north-south and three east-west highways to highway departments in 48 states, checked traffic flow at representative points, estimated the anticipated toll collections and compiled data on all items of cost, including right-of-way acquisition, construction, operation, and finance charges.

Weighing all factors and without cutting corners in any particular, it was estimated the total construction cost of the 14,336 mile toll-road system would be \$2,899,440,000; or \$184,050,000 annually for the period 1945-1960; while the maximum amount of traffic which reasonably could be expected to patronize the highways would yield only \$72,140,000 per year, assuming an average rate of toll at 1.5 cents per vehicle mile for all vehicles.

It was found that there is no fully transcontinental travel, nor any of semi-continental range which can be accumulated in sufficient volume on any one of several highways skirting across the country either to justify the construction or to estimate the character or location of such roads. By actual count, there are only 300 cars starting daily on transcontinental trips between the Atlantic and the Pacific coasts and few of these, the Bureau said, could be attracted under any circumstances to a single east-west route. Motor truck and bus movements were checked in three far-western states and showed their range of travel to be much shorter than the range of passenger cars.

Long trips were found to be a small percentage of all trips, and as

(TURN TO PAGE 86, PLEASE)



## Maintenance Savers for Any Type of Fleet!

For every requirement of Truck, Tractor, Trailer and Passenger Car fleets, GATKE Brake Liners and Blocks are available in CUSTOM-BILT Sets, service proved for the particular unit and condition.



When fleet operators say GATKE Brake Blocks and Liners reduce maintenance costs, that's only *half* the story.

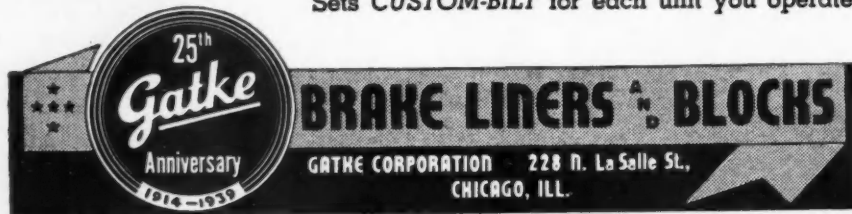
Safety made possible by GATKE Dependable Performance comes first in real economy.

Fewer brake adjustments keep equipment rolling, instead of in the shop.

Dependable brake action helps maintain tough schedules with safety.

Why penalize your operation with needless cost and avoidable risk. Install GATKE CUSTOM-BILT Sets on your next five relines. We are confident you'll never be satisfied with ordinary brake liners again.

Your GATKE Jobber will gladly recommend Sets CUSTOM-BILT for each unit you operate.



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COMMERCIAL CAR JOURNAL  
JUNE, 1939



the answer to

*higher taxes, higher wages*

higher fuel costs

To the fleet operator or truck owner, Cummins Dependable Diesels offer these advantages:

1. A seven-year record for dependability—a record accumulated by operators of every size and type—every load, traffic, and road condition from coast to coast.
2. An investment whose proved earnings continue to pile up after a second and third 200,000 miles of service.
3. A demonstrated way to substantially reduce the cost of every ton mile.

To you, the "job-test evidence" back of the Cummins Diesel is important because it substitutes certainty for hope . . . proof for expectancy. Why experiment? Cummins Engine Co., 1016 Wilson Street, Columbus, Indiana.

*One of five Cummins Diesel-powered Internationals Model DRD-70, owned by Willett, Chicago. This unit hauls 6685 gallons of gasoline and operates two shifts a day. The other four operate out of Springfield, Ohio.*

**CUMMINS**  
Dependable  
**DIESEL**

PIONEER IN MODERN DIESEL DEVELOPMENT



(CONTINUED FROM PAGE 84)

only a long-distance traveler would accept or tolerate any diversion from his direct course to enjoy superior highways, it was concluded that the traffic volume which could be listed as transferable to a limited-access road from a generally parallel normal highway at a considerable distance must be very small, probably less than one-third of all cars on the road.

If Congressional devotees of the toll-road nostrum persist, however,

the Bureau will have no objection to Congress putting the findings to the acid test by building a super-road between Boston and Washington where there is "a reasonable prospect of the recovery of the costs through tolls."

The recommendations outlined two specific plans of action for Congressional consideration in the interest of providing improved road facilities wherever the needs are sufficient to justify the improvements. The first plan, depending exclusively upon

local action, included the repair and improvement of existing roads by reducing excessive curvatures, flattening heavy grades, widening pavements, constructing additional lanes, and separating highway and railroad crossings. The second plan, requiring Congressional action, would aim at the construction of long distance, inter-regional highways to supplement present indirect roads.

The national highway system outlined, consisting of 26,700 miles of roads designed to meet peace-time and national defense requirements, was represented as including every line of inter-regional travel in the country to which would be attracted new activity in "contradistinction to the traffic repelling tendency of the proposed toll-road system."

The suggested routes would follow the alinement of existing highways. Pavements more than two lanes wide would be provided where traffic exceeds 2000 vehicles per average day; the right to limit access would be invoked wherever entering vehicles interfere with the freedom of movement of the main traffic stream. Right-of-way widths in rural areas would not be less than 300 ft. and in urban areas not less than 160 ft. By providing ample capacity and every safety device known to modern highway engineering, the roads could be expected to effect a greater reduction in highway accidents than could be made by an equivalent sum spent for highways in any other way.

The Bureau found that problems involving large volumes of traffic are found almost exclusively on the Federal-aid and state highway systems and on city streets and suggested that any program designed to improve other highway systems should be weighed carefully since the roads in the latter category constitute about 2,650,000 miles of road but serve only 10 per cent of the total traffic.

Main highways, comprising the Federal-aid and state highway systems and their trans-city connections, serve approximately 60 per cent of the total vehicle-milage on all roads and streets although these systems constitute only 16 per cent of the total mileage. Local city streets, constituting only 6 per cent of the total road and street mileage, serve approximately 30 per cent of the total traffic; other country and rural roads.

(TURN TO PAGE 88, PLEASE)



**SPECIFICATIONS GOVERNOR BODIES MUST BE ALUMINUM**

**Here's why Governor Specifications call for Aluminum:**

- CUTS MAINTENANCE COSTS
- ELIMINATES TROUBLES DUE TO HEAT
- GUARANTEES MAINTAINED EFFICIENCY

Aluminum is best for governor bodies . . . because of its superior heat-resisting qualities which prevent shrinkage and warpage . . . that's why you'll find only the best of heavy wall aluminum construction in a Hoof Governor. You'll find the best of everything in materials and design . . . because Hoof has spared no expense to make a governor which has a performance record second to none! You'll find the famous cantilever spring—(always maintaining its factory calibrated efficiency)—which eliminates the use of complicated cams, coil springs that stretch, pistons and dash pots that stick. You'll find stainless steel parts such as the oversize sturdy shaft . . . 3 husky ball bearings . . . the butterfly valve . . . and scores of other quality features—every one of which contributes an important part in creating a record breaking demand for Hoof Cantilever Governors.

See your jobber or write.



**SEND FOR CHECK CHART**  
to secure greatest fuel economy from any governor and carburetor combination. It's free.

## HOOF Cantilever GOVERNORS

Write for details on Hoof Brake Eyes, the Hydraulic Brake Safeguard and Hoof Fuel Economizers for Ford and Chevrolet Trucks.

**HOOF PRODUCTS CO., Dept. BEC, 6543 S. Laramie Ave., CHICAGO, ILL.**

**Makers of the FAMOUS HOOF CANTILEVER GOVERNORS.**

## MARMON-HERRINGTON *All-Wheel-Drive* FORD



### "IS USED TO PULL MUCH LARGER TRUCKS THROUGH ... *When the going is Bad*"

THERE'S no secret, nothing mysterious about the amazing pulling power of Marmon-Herrington *All-Wheel-Drive* Fords. With power and traction *on the front wheels, as well as on the rear wheels*, bad roads become easier to travel, loads become easier to haul, hills become easier to climb.

And when the going becomes simply "impossible" for conventional drive vehicles, because of mud or sand or snow, these *All-Wheel-Drive* Fords walk right through—taking materials, men and equipment wherever you want them to go.

#### **Rapidly Increasing In Favor**

For many years Marmon-Herrington *All-Wheel-Drive* vehicles have been doing miraculous things in the world's toughest jobs of transportation—over the world's worst roads, or where there were no roads at all—in the oil fields, in logging, mining, etc. But now that Marmon-Herrington is converting all standard Fords to *All-Wheel-Drive*, literally scores of new opportunities to make and save money with these vehicles are arising daily.

Contractors on construction projects, road builders,

town, township, county, state and Federal highway maintenance officials, public utility men, owners of large scale agricultural projects, operators of overland hauling systems—all these, and scores more, are now finding Marmon-Herrington *All-Wheel-Drive* Fords the most profitable investments they ever made in automotive equipment.

#### **Unsurpassed for Road Building and Maintenance**

"Did more than we thought possible," "gave us a smoother road surface faster than any equipment we ever had—used to pull heavier trucks through tough going," "Still amazed at its performance. It sure has made a believer out of me," "Keeps our roads clear of snow at one third the cost." These are but a few of the scores of similar expressions about Marmon-Herrington

*All-Wheel-Drive* Fords from municipal, township, county and state highway officials, in our files.

Why not get *all the facts* about these amazingly profitable vehicles now? Write for literature, and name of nearest dealer.



**MARMON-HERRINGTON CO., Inc., Indianapolis, Indiana, U. S. A.**

Cable Address: MARTON, Indianapolis, U. S. A.



(CONTINUED FROM PAGE 86)

78 per cent and serve only about 10 per cent of the total traffic.

Taking cognizance of clamor from some sources for putting WPA labor to work building super-highways, the Bureau suggested that "possibly no other work . . . would so profitably provide employment coincident with the centers of present unemployment" as the construction of trans-city connections. Because the greater part of locally generated in-and-out traffic in large cities cannot be drained off

through by-pass roads, the report urged the construction of depressed or elevated arteries to carry the traffic into and through the heart of cities. It put these projects at the head of the list for prompt consideration.

Next on the Bureau's "must" list was the construction of belt-line distribution roads which, while bypassing a city and permitting more direct entrance to off-center parts, would form a circumferential or belt-line route around a city's outer fringe. Because right-of-way difficul-

ties have persistently stood in the way of laying out new routes, it was suggested that Congress take steps to dovetail the slum-clearance program with the roads building program on the theory that old, decadent areas in many cities are being purchased, new buildings are going up, and trans-city routes should be laid out without delay so that their eventual courses may not be blocked by the mushrooming of other projects.

The crux of the whole long-range program, the Bureau conceded, is the right-of-way problem, primarily because the laws have not kept pace with the phenomenal growth of highway traffic. A few state legislatures have liberalized the laws, and the courts, generally more responsive to traffic growth than heretofore, are slowly taking a more liberal attitude toward the taking of lands for "public use."

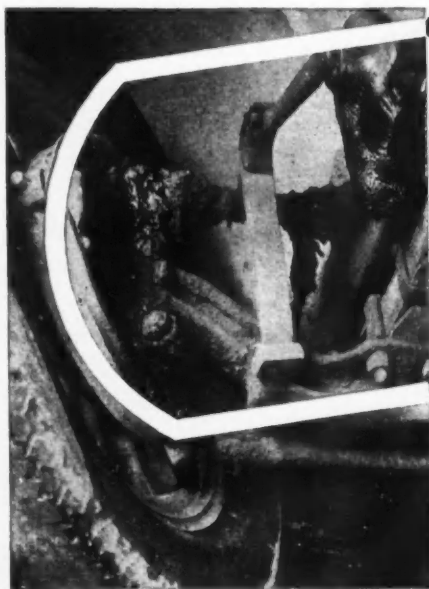
As the most effective weapon for attacking the right-of-way problem, the Bureau proposed the creation of a Federal Land Authority, whose jurisdiction would be general throughout the states. It would be given sufficient funds and authority to acquire land needed for road improvements substantially in advance of the scheduled road construction date and would be empowered to begin construction before the question of compensation or damages had been determined by the courts. Of course, legislative changes—a slow tedious process at best—would be necessary in most of the states.

To be vested with discretionary power to determine right-of-way widths and whether excess taking is necessary for future needs, the Authority would, at the request of state highway departments, purchase the land and hold, sell, or lease to the state over a period of 50 years on terms designed to amortize the initial cost. The Authority's jurisdiction would not be limited to the purchase of land for highway use but would extend to other purchases where the Federal Government had an interest in buying the land.

Turning back to the adverse report on toll-road highways, another factor weighed by the Bureau was the reaction of the average motorist to toll charges. When John Smith, the average car owner earning \$1,500 a year or less, takes to the open road he thinks only in terms of immediate

(TURN TO PAGE 90, PLEASE)

## DIRT...



**HYPRESSURE JENNY  
STEAM CLEANING RE-  
MOVES DIRT QUICKLY,  
EASILY, ECONOMICALLY**



**STEALS  
UP TO 400  
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There's plenty of evidence to prove that DIRT may add 50 to 400 pounds of dead weight to every load you carry . . . if allowed to accumulate on bodies, fenders and chassis of trucks or trailers. Hypressure Jenny Steam Cleaning will quickly rid you of this costly "free passenger." It will "up" your PAYLOAD and reduce your fleet maintenance costs 25 to 40%. With HYPRESSURE JENNY on the job, cleaning work that formerly took hours may be completed in minutes—inspection and repair work is speeded and JENNY keeps 'em rolling at lower costs. Ask us to prove it. Return the coupon today for a survey of possible savings to you. No obligation.

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Go ahead—tell us how and how much JENNY can save us.  
We have . . . . . men employed in maintenance.  
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JUNE, 1939

# ● Reduce Clutch Wear and Trouble— ● Get MORE Clutch Engagements—

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Twenty ball-hinged levers multiply the spring pressure on the pressure plate and positively engage the friction disc. The spring pressure is evenly distributed *all around* the pressure plate—there is no grab or shock. The thick pressure plate makes contact in an absolutely parallel plane. Therefore, no cocking of the plate, no small area of high speed slippage where localized burning might occur. *Every square inch of surface is uniformly contacted.* Full engagement is rapid, smooth, non-shock and non-slip. The heat of friction is dissipated in two ways: 1—by the thick mass of the pressure plate; 2—by forced air cooling between the driven and driving members that wipes away surface heat.

Wear and tear on the clutch, transmission, drive line, differential and rear axles are all held to a minimum. Clutch life is increased. Clutch service is reduced. You save time, trouble and upkeep expense.

*The new Lipe Clutch Service Manual has just been issued. It shows how simply Lipe clutches can be serviced — and without special tools. Write for a copy.*

**W. C. LIPE, INC.**  
SYRACUSE, N. Y.

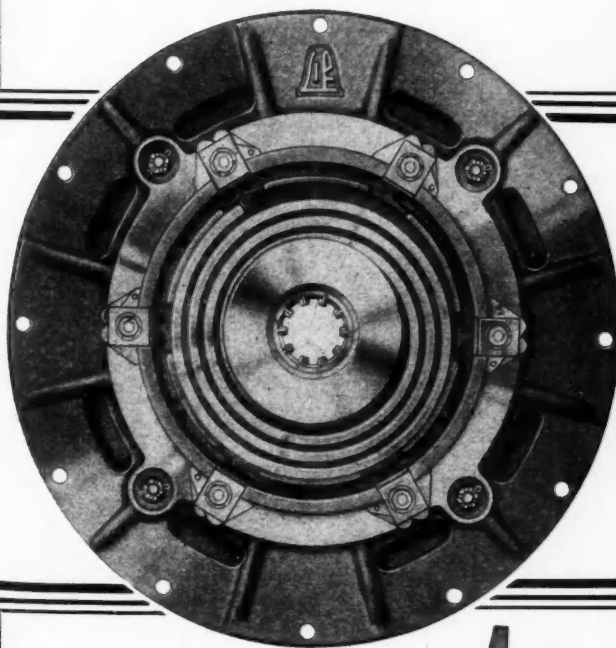


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## WITH **LIPE** Heavy-Duty **CLUTCHES**

*Positive non-shock loading*



### **LIPE** FEATURES THAT INSURE MAXIMUM CLUTCH LIFE

20 Ball-hinged levers that insure uniform pressure, smooth, positive engagement and easy disengagement.

Pressure plate always parallel to facings.

Long facing life.

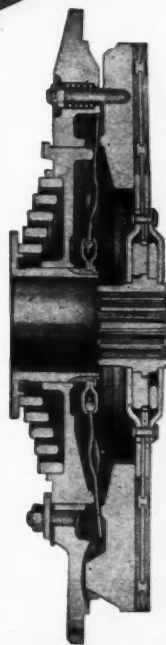
No localized burning.

Warp-resisting pressure plate.

Rigid, cast-iron construction.

Forced internal air-cooling.

Stock Clutches Available—Capacity from 160 to 1250 lbs. Ft. Torque



(CONTINUED FROM PAGE 88)  
operating expenses and the toll rate of 1 cent per mile appears to him as a 100 per cent increase in the cost of running his car. He would soon sour on the idea after a few junkets.

Charging admission to express highways has always been regarded as a prohibitive cost to operators of commercial vehicles. Whether this factor was taken into consideration in the report is not known but the Bureau expressed the view that "commercial vehicles, especially the hea-

vier units, would be attracted to these roads in greater proportion than that in which they are found on the existing roads." This argument, the report noted, was based upon the theory that the value of time and distance saved by using super-roads will be the largest for commercial vehicles.

The estimate that the super-highway system would yield only \$72,140,000 per year, as compared to its annual cost of \$184,050,000, was based upon assumed average toll

rates of 3.5 cents per vehicle-mile for motor trucks and buses and 1 cent per vehicle-mile for passenger cars. Since it was estimated that the ratio of motor trucks and buses to passenger cars would be approximately 1 to 4, the assumed toll rates for each type resulted in an average rate of 1.5 cents per vehicle-mile for all vehicles.

Indicative of the thoroughness with which the roads agency approached the job, Bureau engineers in laying out the toll-road network planned a right-of-way width of 300 feet in rural areas, 160 feet in suburban sections; all designed for normal maximum speeds of 70 miles per hour. Even the normal standards of curvature and gradient were set and provision was made in the design to allow ample provision to permit passing of trucks by passenger cars.

The report referred to Bureau tests which show that larger trucks, when loaded in accordance with the manufacturer's gross weight rating, cannot climb 4 per cent grades at a speed greater than 25 miles per hour; or on a 3 per cent grade, a speed of 30 miles. With vehicles loaded 50 per cent over the manufacturer's rating—a practice which the report said was not uncommon—the corresponding maximum speeds for 4 and 3 per cent grades are 16 and 22 miles per hour respectively. Under either condition of loading, it was noted, a 6 per cent grade slows the larger modern trucks to a crawling speed.

#### THUMBNAILED SKETCHES OF PENDING SUPER-HIGHWAY MEASURES

By Senator Frazier, Republican, of North Dakota, S. 2028

Would create a United States Motorways Commission of Congressional-departmental representatives named by the President and empowered to study and report with recommendations on a national system of highways.

By Representative Jeffries, Republican, of New Jersey, H. R. 5749

Provides for a national super-highway system of safety automobile highways, consisting of 13 designated routes, and emergency airports. To be administered by a Director of Super-highways, subject to the approval of a seven-member commission, the plan calls for prompt award of contracts for all needed materials to aid the unemployed and to stabilize wage levels. Toll charges could not exceed 1 cent per mile for private passenger cars. Director could take necessary steps to control traffic "to prevent unfair competition among common carriers". Construction would be financed with a \$10,000,000,000 bond issued, with 3 per cent bonds guaranteed by the Government.

By Representative Lea, Democrat, of California, H. R. 3753

A designated private group, headed by T. A. Tomasini, would be licensed as an agency of the Federal Government to construct, maintain and operate for a 50-year term parts of a transcontinental system of self-liquidating highways. Empowered to collect tolls at a rate determined by the War Department, the agency would be vested with the right of eminent domain. The highways would be privately financed but open to the use of the public and in the event of war would be under the control of the War Department.

By Senator McKellar, Democrat, of Tennessee, S. 679

Creates a Highway Planning Commission of five Presidential appointees to study all angles involving (Turn to page 92, please)

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OVER  
THESE  
GREAT

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905—1½ Tons—now \$2.80  
912—2 Tons—now \$3.70  
925—3½ Tons—now \$6.95  
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935—8 Tons—now \$11.75  
945—12 Tons—now \$19.50  
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Dealer net prices—slightly higher  
west of Rockies and in Canada.

● Look over these great features . . . "Ryth-Matic" Valve Action for smoother lifting. Pendulum Balance speeds positioning. High Carbon "Gun Barrel" Steel Cylinder for strength, power, and safety. "Micro-Accurate" Safety Release Control for positive lowering. "Snug-Fit" Power Pump for long life, trouble-free action. See them at Jack Headquarters—your Walker Jobber.

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You truck, trailer, tractor and bus operators are in business to make money. The profit you make is whatever portion of your payload dollar is left after all operating expenses are paid.

Labor, gasoline, oil and depreciation are set charges that cannot be reduced. But, there are operating costs that can be reduced, and outstanding among these is braking cost.

Thousands of dollars are spent needlessly each year for brake repairs and maintenance. A goodly portion of this waste can be eliminated by equipping your rolling stock with Wagner Air Brakes.

They are a product of Wagner's proven hydraulic brake engineering ability, and have been developed by engineers who have been in the industry since the inception of hydraulic brakes. This knowledge, plus unlimited manufacturing facilities, is your assurance that Wagner Air Brakes are the ideal brakes for all hydraulic brake equipped trucks, tractors, trailers and buses, as well as those equipped with mechanical brakes. The coupon below is for your convenience. It will bring you complete information.



## Do you know

that the Wagner Brake Testing Laboratory is one of the best and most complete in the entire country? A constant expanding and illustrating the various right and wrong ways of applying Wagner Air Brakes are collected in this book. Check copies at right and you will understand why Wagner Air Brakes always give you perfect performance under all conditions.



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I am interested in receiving full information on the Wagner safety equipment checked below:

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(Continued from page 90)

the construction of a through highway from Washington to New York, including the desirability of charging tolls; and the construction of three transcontinental and three north-south highways. Calls for a Congressional appropriation of \$200,000.

**By Representative Randolph, Democrat, of West Virginia, H. R. 2767**

Would create a Transcontinental Streamlined Super-Highway Corp., whose job would be to lay plans, supervise construction, maintain and operate two north-south and two east-west super-highways. Construction funds would be raised by a \$3,000,000,000 bond issue over a four-year period with 3 per cent bonds to mature in 30 years. Tolls fixed by the ICC would be collected by the Corporation which would be vested with the right of eminent domain. A five-man commission would administer the plan.

**By Representative Snyder, Democrat, of Pennsylvania, H. R. 1939**

The Department of Interior with the aid of Army Engineers and the Bureau of Public Roads would be authorized to locate and build three transcontinental and six north-south highways which would avoid large cities. An \$8,000,000,000 Treasury appropriation would be expended over a 16-year period. A 10-man com-

mission would purchase rights-of-way. Contractors building the roads would have to give prior consideration to the employment of workers between 50 and 65. The question of tolls is left open.

**By Senator Lundeen, Farmer-Laborite, of Minnesota, S. 814**

Almost identical to the Snyder bill except that it specifically routes one of the highways through the Senator's state.

#### Pooled Pick-Up for Los Angeles

Associated Carriers Agency of Los Angeles now handles a pooled pick up and delivery of seven truck lines serving 500 shippers out of Los Angeles. Combined bookkeeping as well as combined physical undertakings have brought about marked improvements from the standpoint of cost and convenience.

## SERVICING GM INJECTOR

(CONTINUED FROM PAGE 34)

air and wipe thoroughly with toilet tissue. (Do not use rag.) Bearing surface of bushing can be dried by wrapping toilet tissue around tool (GM No. 1021), a simple cylinder of the correct diameter with a longitudinal slit from which to start and hold the tissue. Work tool in and out and rotate. Insert plunger in bushing making sure that fingers do not touch bearing surface as moisture or dirt left by fingers may cause plunger to stick. With bushing on bearing surface of plunger, spin bushing with fingers. It should spin freely. At least as free as a small, clean, well-oiled ball bearing. If it does not, start in and clean and blow, clean and blow until it does.

7. After carbon and discoloration have been removed from spray tip by immersion in cleaning pan No. 1 and brushing with an extra fine wire brush, hold in under magnifying glass and punch out the six spray holes with tool (GM No. KMO-235), which is a handle for holding a length of .006 in. music wire. Rotate the wire in the orifice. When using a new length of wire it may be necessary to stone the end of it to remove burrs caused by cutting. After long service it might be well to test orifices with .007 in. wire. If wire enters holes the tip must be discarded but indications are that this will happen only after enormous mileages.

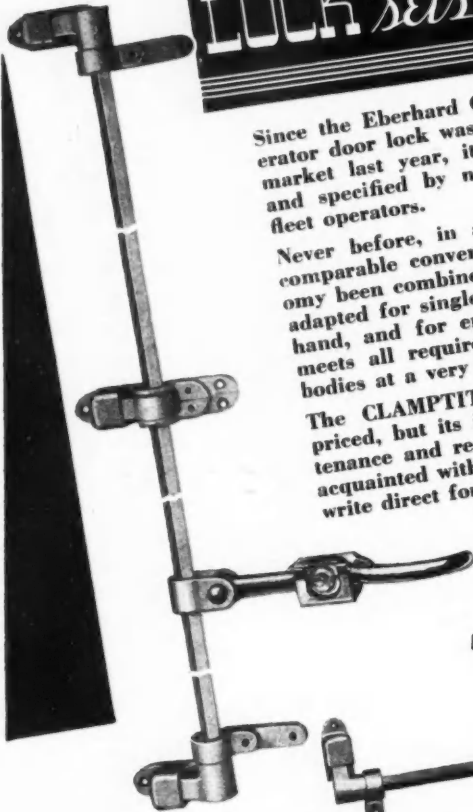
8. Using tool (GM No. J-1243) ream out inside of spray tip to remove accumulated foreign matter. Wash out in No. 1 cleaning pan and blow dry before rinsing in No. 2 cleaning pan.

9. After cleaning and blowing check valve-check seats for any discoloration. If discolored, polish on lapping block, using a figure eight motion. Lap only for discoloration and do as little of it as possible. If there is mechanical damage to these parts a matched set of spacer, flat valve, double-check valve seat and spherical valve must be used in replacement.

10. Before reassembly make sure  
(TURN TO PAGE 94, PLEASE)

# Eberhard's CLAMPTITE

## LOCK sets NEW Standards




Since the Eberhard CLAMPTITE van and refrigerator door lock was perfected and placed on the market last year, it has been thoroughly tested and specified by numbers of America's leading fleet operators.

Never before, in a lock for heavier doors, has comparable convenience, dependability and economy been combined with such versatility. Equally adapted for single or double doors, right- or left-hand, and for end gates, the CLAMPTITE lock meets all requirements for van and refrigerator bodies at a very reasonable cost.

The CLAMPTITE lock is not only attractively priced, but its installation also insures low maintenance and repair costs. It will pay you to get acquainted with CLAMPTITE. See your dealer or write direct for Bulletin No. 130.

See your dealer immediately  
or write direct to  
**EBERHARD MANUFACTURING CO.**  
Division of The Eastern Malleable Iron Co.  
CLEVELAND, OHIO



The illustration at the left shows the CLAMPTITE as applied to single or double doors with built-in lock, handle and three lugs, bearings and keepers. Note position of handle for most convenient operation. For shorter doors middle lug, bearing and keeper are simply omitted.

For end gate with double doors above, one keeper may be mounted on door, as shown. Note center position of padlock handle for best appearance.

# EBERHARD Clamptite

## UNIVERSAL DOOR & GATE LOCK

Ask for Bulletin NO. 130

E

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# The Truck Trend Proves It...

# CHEVROLET'S

# the Chassis



American business and industry bought 115,426 trucks in the first quarter of 1939—a gain of 19,769 over the same period of last year. That is a nice increase *for the truck industry—20.7 per cent.*

American business and industry bought 41,555 Chevrolet trucks in the first quarter of 1939—a gain of 9,892 units over last year. And *that is a nice increase for Chevrolet—31.2 per cent.*

Chevrolet's gain over last year—exceeding the gain of all other makes combined—is due to two main factors: First, Chevrolet's proved records of efficient transportation at lowest cost; and, second, Chevrolet's enlarged line of models, making Chevrolet economy and excellence available in many more truck operations than ever before. Now there are 45 models to choose from—including one fitted to *your* needs.

CHEVROLET MOTOR DIVISION, General Motors Sales Corporation, DETROIT, MICHIGAN  
General Motors Instalment Plan—convenient, economical monthly payments. A General Motors Value.

DESIGNED FOR THE LOAD



POWERED FOR THE PULL

MASSIVE NEW SUPREMLINE TRUCK STYLING . . . COUPE-TYPE CABS . . . VASTLY IMPROVED VISIBILITY • FAMOUS VALVE-IN-HEAD TRUCK ENGINE • POWERFUL HYDRAULIC TRUCK BRAKES (Vacuum-Power Brake Equipment optional on Heavy Duty models at additional cost) • FULL-FLOATING REAR AXLE on Heavy Duty models only (2-Speed Axle optional on Heavy Duty models at additional cost)



## GM INJECTOR

(CONTINUED FROM PAGE 92)

that all parts placed in No. 1 cleaning pan have been thoroughly cleaned and blown dry, then rinsed in No. 2 cleaning pan and blown dry and finally wiped with tissue. In cleaning filters be sure to blow the air from the inside out. Replace neoprene seat nut gaskets.

11. To reassemble place injector

body in holding vise in inverted position. Oil all parts as assembled with light oil.

12. Insert rack in injector body with yoke toward the side of the injector on which dowel pin is located. Note that teeth Nos. 5 and 6 on the rack are punch marked. Center these teeth in body of injector so that tooth No. 3 on the pinion, which is also marked, can be dropped into mating position with them. Install spacer.

13. Place bushing on body with bushing pin in slot of body. Place

flat check-valve seat on bushing and then place flat check valve on seat, covering it with spherical check valve seat making sure that flat check-valve fits into recess. Insert spherical check-valve in check-valve spring and insert check-valve stop in other end of spring. Add assembly placing spherical valve on its seat and hold check-valve assembly in place by placing spray-valve tip over it and holding with finger.

14. Take tool (GM No. KMO-235) and place end on spray tip to hold it in position while spill deflector is dropped into position. Then place seat nut over tool and gently line up parts. When in proper position, oil threads. Seat nut should screw down by hand until the gasket seats. Tighten seat nut not to exceed  $\frac{1}{2}$  turn with wrench.

15. Place injector in holding vise in right side up position. Install fuel filters in place with holes downward. Install springs and fuel line connectors making sure that threads are oiled and that new copper gaskets are in place on connectors. Unless injector is to be used immediately screw acorn nuts on connectors to prevent dirt from entering. Threads on nuts must be oiled. All threads on injector should be oiled before installation of mating part to prevent shearing off particles of metal which would get into the injector.

16. Assemble plunger through follower guide and install follower and lock pin. Slide follower spring in place and no matter how careful you have been again wipe bearing surface of plunger with clean tissue.

17. Note timing flat on pinion and insert plunger so that flat on plunger will mate and a gentle downward pressure will place plunger in proper position. Make sure that slot in plunger follower guide is lined up with hole in injector body so that stop pin can be installed. Install stop pin.

18. Check the injector on the testing equipment as previously outlined.

General Motors' recommendation at this writing is not to dis-assemble injectors unless there is some indication that something is wrong with them. They do not advise dis-assembly for inspection. Test injectors at inspection periods but do not dis-assemble unless test shows some fault.

Next month—The GM Blower.



## AKRAFLO FUEL CONSUMPTION METER

... The meter that tells you ALL about fuel consumption! Like many fleet operators you have long searched for a way to check drivers and motors, fuels, payloads and other factors ... and from experience have learned that the only accurate way to check fuel is AT THE MOTOR. That's just what AKRAFLO does ... for it's a star performer in cutting fleet fuel costs. At its moderate price, Akraflo will pay for itself quickly. Get full details — NOW!

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**BOWSER** makers of the worlds  
most widely used meter

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JUNE, 1939

## COSTS

(CONTINUED FROM PAGE 23)

trucks have been purchased to replace one of the older larger ones.

In both of these fleets which provide a good cross section of fleet operation it is to be noted that the depression was instrumental in producing the lowest operating costs. Increased labor rates and material costs as well as increases in the prices of the vehicles have contributed to the increases since 1933. The increases in costs have, however, been kept to a minimum by good fleet management in both cases.

Experience in heavy duty truck equipment has shown that if the engine is overloaded its efficiency and economy is reduced. Why doesn't the same principle apply to the small car and one-half ton truck? As a matter of fact I think it does. The 60 hp. Ford has proved quite unsatisfactory in many localities, yet the 85 hp. is too large, providing too much power. As an example, I wish to cite the operation of fifteen 60 hp. Fords and fifteen 85 hp. models in the same service, in a city which is quite hilly, in which case the cost of the 60 hp. units is 5 mills per mile higher than the 85 hp. cars. Poor accelerating ability and the high motor speed necessary for maximum torque are the prime contributing factors to this result. In my opinion the economy desired could have been obtained with a motor of approximately 20 cu. in. more displacement than the 60 hp. Ford, yet the performance would not have been curtailed to the extent that it is dangerous in heavy traffic. The motor would not be overloaded to the extent that its efficiency is reduced to a point lower than the 85 hp. motor.

I thoroughly disagree with the attempts of Chevrolet and Plymouth to reach an ultimate in economy. Experience in bus operation indicates that the economy is proportional to the weight regardless of the design. I use this comparison because of the controlled operating conditions which provide a good comparison. It seems logical to assume therefore that the economy which has been realized is due to forcing the driver to operate the car at reasonable speed and acceleration. Tests conducted by one of our operating companies indicate just what can be done in regulating

speed and particularly acceleration. The results are so outstanding that I have included them in this paper. Figs. 4 and 5 indicate the results of fast driving and acceleration on gasoline mileage and a brief description of the tests follows:

Fig. 4 shows the effect of high speed operation on gasoline mileage. The data was obtained on a 1935 V-8 85 hp. coach. The tests were made with a standard mileage tester and all tests were made at constant speed. Note the drop in mileage at speeds

above 55 m.p.h. resulting from the opening of the power jet in the carburetor.

### Study of Driving Habits

Fig. 5 shows the results obtained and the savings possible by developing economical driving habits. The tests were conducted as follows:

A. Low gear accelerate gradually to 7 m.p.h.

Second gear accelerate gradually to 14 m.p.h.

(TURN TO NEXT PAGE, PLEASE)

AT LAST... A REAL ADVANCE  
IN TRUCK-TIRE ECONOMY!

# Recap Indicator

PAT. PENDING

Like most startling advances, simplicity itself! Just before tire wears into the danger zone, Recap Indicator appears as series of red dots—exact signal to your maintenance man to recap NOW!

BUILT INTO

## DENMAN

TRUCK AND BUS

## TIRES

NORMAL  
SAFE  
MILEAGE  
ZONE

25,500  
MILES  
OF  
TIRE  
WEAR

RECIP INDICATOR

DANGER ZONE

6,000  
MILES

Graph shows Recap Indicator located just above Danger Zone. Note that recapping at this point gives you 25,500 MORE safe, non-skid miles, instead of the 6,000 highly hazardous miles remaining in ordinary tread (based on operation at 1,500 miles per 1/2" of tire-wear.)



**THE FINEST TIRE  
THIS COUNTRY KNOWS  
REGARDLESS OF PRICE!**



Built with Denman's EXCLUSIVE Red Inside Shock Pad—dissipates heat and friction, protects against road hazard. And, in addition: Denman Permanent Calkooder revolutionizes itself after fatigue • Toughest Tread Rubber Known • Extra Reinforcements • Super-Resistant Shoulder Cushions • Extra Heavy Breakers • Bead-to-Bead Outer Ply Breakers • Piano Steel Wire Built-up Bead Construction • NO OTHER TIRE HAS ALL THESE FEATURES. And— to your special order—Denman's exclusive Recap Indicator and Under-Field Tread!

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WRITE TODAY for these important, interesting and profit-building booklets: "Analysis of Tire Recapping" and "Report No. 34—The Recap Indicator."

Denman Tire & Rubber Co., Warren, Ohio.

Send me "Analysis of Tire Recapping" and "Report No. 34—The Recap Indicator," together with detailed information on all types of Denman Double-Life Tires and Denman National Service Facilities.

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## BACK-UP LIGHTS




### ELIMINATE SHADOWS

**TWO MODELS** —efficient and dependable  
—designed to provide safety when backing.

QUALITY products of famed K-D standard which means BEST. An item which is steadily proving more popular . . . easy to feature . . . easy to sell.



**MODEL NO. 858**

Attached to rear bumper guard. Black enamel with stainless steel door.

**MODEL NO. 859**

Diamond-shaped to give maximum spread of vertical and horizontal light. Chromium plate or black enamel with chromium door.



**Model No. 859**

**Write for details**

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# The K-D Lamp Co.

## CINCINNATI, O.



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complete facts  
on the McCulloch  
Supercharger for Ford  
V-8 trucks and Ford V-8  
and Mercury cars. Write today.

"And how! . . . With the McCulloch Supercharger on my Ford V-8 truck, hills are a cinch," say truck operators everywhere. "You don't shift gears half as much." Increased torque—that's the secret of McCulloch amazing performance. You step up your engine from 85 to 124 horsepower, increase gas mileage from 7.3 to 19.7%—all without materially increasing weight. Give your Ford V-8 truck the benefits of this modern engineering development for faster schedules, greater loads, easier operation at lower cost.

**MCCULLOCH ENGINEERING COMPANY**  
3223 1/2 NORTH 31ST STREET • MILWAUKEE, WISCONSIN

(CONTINUED FROM PAGE 97)

High gear accelerate gradually to 25 m.p.h.

Brake used as little as possible.

Let engine act as brake making a gradual smooth stop.

B. Low gear as in Test A.

Second gear as in Test A.

High gear accelerate fast to 25 m.p.h.

Brake as in Test A.

C. Low gear as in Test A.

Second gear as in Test A.

High gear accelerate fast to 25 m.p.h.

Brake used *hard*. Speed kept at 25 m.p.h. until brakes had to be applied to make stop.

D. Low gear accelerate fast to 14 m.p.h.

Second gear accelerate fast to 25 m.p.h.

High gear speed held to 25 m.p.h.

Brake *hard* to stop.

These tests were made on a straight course with a stake each 1/10 mile. A complete stop was made at each stake. Maximum speed was held to 25 m.p.h.

*The difference in time required to*

*drive a mile in Test A and Test D was only 5 sec.*

From the tests will be seen the advisability, both for the company and for the personal car, of improving driving habits. Note particularly the small amount of the time saved by hurrying.

What then should be the operators' demand for future economy? Here are a few suggestions:

1. Reduced vehicle weight.
2. Reduced engine size keeping the hp. vs. weight ratio high enough for good engine efficiency.
3. Improved carburetion.
4. Improved ignition.

Reduced weight should be simple with high tensile steel and aluminum alloys. Reducing the vehicle weight will permit reduced engine size but it should not be obtained by using the same block with smaller bore and shorter stroke. A reduction in the weight of the engine is also advisable and necessary. As regards carburetion and ignition, it is my opinion that vast improvements will be made in the next few years. It is sincerely hoped that this improvement will re-

duce the need of some of the specialized maintenance equipment and highly trained maintenance personnel.

One of the independent manufacturers announced a car which is supposed to provide the economy, performance, durability, etc., which will answer the operators' problem. It has not been on the market long enough for the operators to determine the results, but regardless of the future of this car, it seems to me that the theory is correct. Furthermore, it was my pleasure to hear the president of this company talk about economy of operation. Perhaps this is the start of a new trend of thought in the minds of the executives of the automobile manufacturers. Let us hope so.

#### Condensed Comments

**Personnel:** "One of our operations consisting of 150 cars traveling 2,000,000 miles annually has the following maintenance force: 1 foreman, 2 washers, 4 service men and 4 mechanics."

**Economical Life:** "Depreciation on (TURN TO PAGE 100, PLEASE)"





1932-1939. At left is the first Cincinnati flusher with Aluminum tank, put in service in 1932, still running. Since, 5 more have been purchased and two like the 3000 gal. job below are being built by Davis Welding and Mfg. Co. All were designed by Cincinnati Highway Dept.

Another advertisement based on reports from our engineers in the field, detailing the experience of truck operators now using truck bodies and trailers constructed of Alcoa Aluminum. Facts are obtained directly from the operator.



*Field Report  
on:*

## HOW ALUMINUM SAVES FOR CINCINNATI CITIZENS

*The Savings start with Weight!*

CITIZENS OF CINCINNATI are saving money on gasoline, oil, tires and paint.

They are saving because six street-flushers, owned by the city, are equipped with all-Aluminum tanks and fittings. Weight savings ranging from 1044 lbs. (on an 800-gal. tank) to 3667 lbs. (on 3000-gal. tanks) bring operating savings. And the resistance to corrosion of Alcoa Aluminum Alloys not only saves on repair and maintenance costs, but also gives the tanks an outer surface so bright and attractive that they

are not painted! Painting cost is therefore *nothing*.

This continued satisfaction over a long period is typical of operators who have tried equipment built of Alcoa Aluminum. Aluminum tanks, truck bodies, and trailers ordinarily increase payload (by reducing dead weight) so they pay for themselves in less than a year. Ask any up-to-date builder to explain how equipment constructed of Alcoa Aluminum Alloys can serve your trucking needs. ALUMINUM COMPANY OF AMERICA, 2139 Gulf Building, Pittsburgh, Pennsylvania.

ALCOA  ALUMINUM

(CONTINUED FROM PAGE 98)

most of our cars is established by using 65,000 miles or 60 months for 85 per cent of the cost, leaving 15 per cent as estimated salvage. Experience indicates that over 20 per cent of the original cost is being realized on vehicles which have been fully depreciated and the difference is credited to the costs of the old vehicle when it is traded in. After considerable discussion, the management agreed to waive the 65,000 miles life expectancy and allow trades when they

were more economical. The result in one location has been most outstanding. During 1938, 32 per cent salvage was realized on passenger cars and pick-ups, making the depreciation costs less than 7 mills per mile. The service in this area is rather severe and we have adopted a plan of making replacements before the first major overhaul is necessary, which will vary from 35,000 to 80,000 miles depending upon operating conditions."

**Gadgets:** "An accessory out of the

gadget class is the condenser which can be connected to the radiator for condensing volatile anti-freeze. We have used a number of these units with very satisfactory results and in many areas consider them to be essential.

"Top cylinder lubricants are placed in the gadget class. That is, they do no particular harm as most of them are ordinary perfumed lubricating oil but they do no particular good and therefore are a waste of money. If carbon needs removing, top cylinder lubrication won't remove it.

"Another group of gadgets are the sludge removers. There may be a few of these on the market which are satisfactory but there are so many others that the safest recommendation is not to use them. We have found that the best method of removing sludge is to reverse flush the crankcase using kerosene under 20 to 30 lb. pressure."

**Repair Practices:** "During the last two years we have had some very sad experiences where dealers in small towns either do not know or do not care to maintain the vehicles in serviceable condition. In addition to being paid for the repairs they were paid for the inspection and to our surprise, many items were overlooked and we were forced to discontinue the practice due to the fact that we got nothing for the money we spent for the inspection."

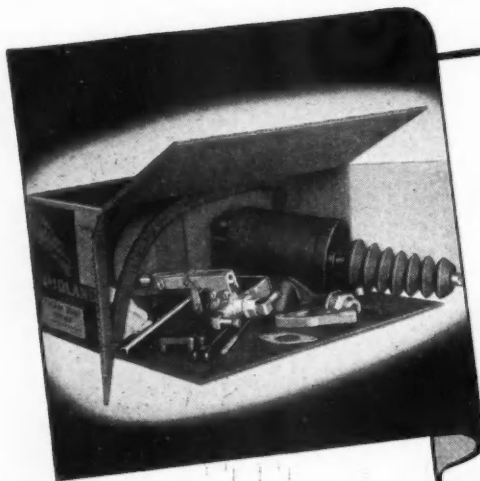
**Tires:** "When cars using 5.50/16 tires are purchased we specify a change to 6.00/16. We feel that the greater mileage will more than pay the difference and an additional size in stock is eliminated.

"Probably the best recommendation is that if you now have a tire record, keep it. If you don't—make a careful study of the costs before starting it."

**Use of Vehicles:** "Mr. Fred Heinlein of the Cincinnati Gas and Electric Co. has prepared a comparison of the costs of coupes and the 1/2-ton truck.

	Miles per gal.	Cost per mile	Annual License Fee
1/2 ton truck	12.0	\$0.57	\$23.99
Coupe	18.3	0.43	7.00

"Total savings per year by using coupe instead of 1/2 ton truck is \$240.90. Mileage reduction due to fact that coupe can be used on the boulevards is 1800 miles annually per car."



**This is the  
Brake for you!**

**COMPLETE KITS  
ENGINEERED FOR  
POPULAR TRUCKS**

Made by one of the world's largest manufacturers of automotive accessories, Midland power brakes *never cost more* and generally *less* than other power brake equipment.

**GUARANTEED SERVICE  
IN EVERY  
IMPORTANT CENTER**

• Midland Power Brake Kits include every nut, bolt and screw needed for simple installation on Ford, Chevrolet, Dodge, G. M. C. and International trucks and tractors.

**PRICED WITHIN  
EVERY FLEET  
OPERATOR'S BUDGET**

A nation-wide distributor organization plus Midland's "Factory Rebuilt Exchange Plan" assures prompt and economical service. See your nearest Midland distributor today for prices and complete information.

**THE MIDLAND STEEL PRODUCTS CO.**  
10605 MADISON AVENUE CLEVELAND, OHIO  
Export Dept., 38 Pearl Street, New York City



When writing to advertisers please mention Commercial Car Journal

COMMERCIAL CAR JOURNAL  
JUNE, 1939

**FOR LOW COST MAINTENANCE**

# Specify BLOOD BROTHERS UNIVERSAL JOINTS

Whatever your requirements, if your problem is to transmit power at an angle, our field and factory experience of more than 30 years is at your command. Our Engineering Department will gladly submit quotations covering your requirements.

**BLOOD BROTHERS  
MACHINE COMPANY**  
DIVISION OF STANDARD STEEL SPRING COMPANY  
**ALLEGAN • MICHIGAN**

## This Burch Achievement Leaves NO COMPARISON

The Burch Hydromotor Hoist is miles ahead of competition. It gives equal power up or down—locks automatically, any position—has one moving part—no exposed working parts—no oil lines.

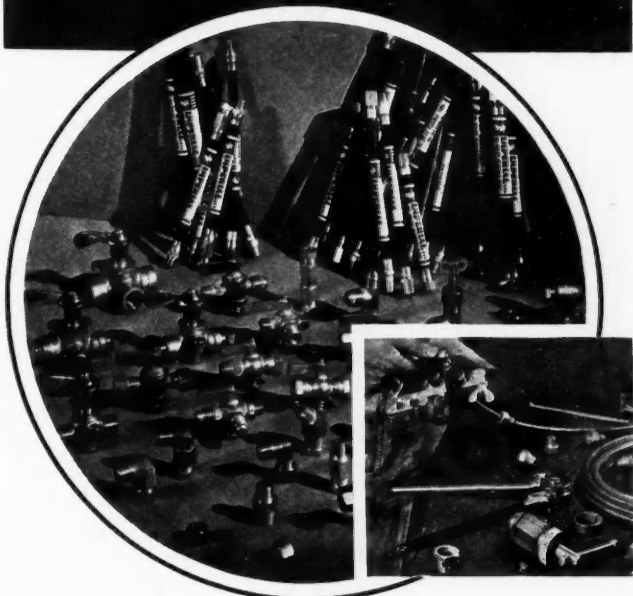
Burch sturdy steel bodies are also far advanced in design. For strength they have no equal.

**The Best Buy  
Is Burch Dump  
Bodies and  
HYDROMOTOR  
Hoists**



**THE BURCH CORPORATION**  
330 THOMAN ST., CRESTLINE, OHIO

## TAKE THE GRIEF OUT OF TUBING CONNECTION WORK



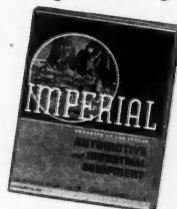
**I**T is surprising how much trouble tubing connection work can cause in the operation of commercial vehicles. One failure of a tube coupling or a fuel or oil line can cause a loss of time that will far outweigh the slightly greater first cost of better couplings and flexible lines.

Fleet operators have found that these four steps will take the grief out of tubing connection work:

- 1** Periodically check the condition of the tubing connections and flexible tubing.
- 2** Equip the shop with all the various sizes and types of fittings for brass tubing that may be needed for any emergency job. Imperial has developed a number of kits that make it possible to maintain such a stock on a very economical basis.
- 3** Maintain a small stock of ready-made flexible fuel and oil lines for your cars. Or you can get a coil of tubing and an assortment of couplings and make up your own lines as you need them.
- 4** Be sure you have the latest Imperial tools for handling tubing connection work.

By following these four simple suggestions, fleet owners are improving their tubing connection practice and reducing loss of time due to tubing failures.

**THE IMPERIAL BRASS MFG. CO.**  
1209 W. Harrison Street, Chicago, Ill.



• Tubing connection work is covered very completely in the new catalog No. 121. It gives you complete information on the latest Imperial kits of fittings and flexible tubing, and covers the various tube working tools and other Imperial service aids. Write for your copy.

**IMPERIAL Automotive Products**

TUBE FITTINGS • FLEXIBLE TUBING • TUBING SERVICE TOOLS • FREEZETESTERS • WELDING OUTFITS AND SUPPLIES





... faster  
... costs less

## REFRIGERATION FOR TRUCKS AND TRAILERS

Write for Facts!

**DROMGOLD and GLENN**

1419 McCormick Bldg.

Chicago, Ill.

# FREE

## Cleanliness for 12 of Your Trucks

THERE'S no better advertisement of your efficiency and your firm's qualities than a clean truck. And there's no better dirt-chaser than No-Film! This concentrated liquid is designed for truck use. It cleans thoroughly because of its energetic chemical action. It never leaves paint-killing film!

Prove it and profit... try No-Film FREE! Send your name and address, the number of your trucks, and your jobber's name. We'll send you enough No-Film to clean a dozen trucks... plus the well-known Technical Bulletins on Truck Finish Maintenance! The Mapor Corp., engineers-chemists, 151 W. 46th Street, New York.

BEFORE YOU START—

THINK of the FINISH

# NO-FILM

REG. U. S. PAT. OFF.

## OSHKOSH

### 4 Wheel Drive Trucks

A proven product. 1½ to 10 ton capacity. Write for complete information.

## OSHKOSH

Motor Trucks, Inc.

Oshkosh, Wis.

## VARNISH

(CONTINUED FROM PAGE 21)

a varnish condition. This sounds logical but so far it appears that investigators have been unable to trace any preponderance of varnish troubles to the engines which have the closest clearances.

This line of thought does provide a possible solution to a puzzle that confuses the efforts of investigators. Frequently a number of identical vehicles operating in identical service under identical conditions produce anything but identical results so far as varnish is concerned. Some of them will have none while in others it will be a serious problem. The suggested solution is that when the piston size high limit and the cylinder size low limit get assembled together the decreased clearance is the one difference that causes the trouble.

Varnish is more frequently found in new engines than in old ones. This is understandable to oil men who explain that the new metal in a new engine acts as a catalyst for whatever chemical action is involved, and that after a period of exposure the surface of the metal becomes chemically inactive.

A number of refinery technicians doubted that a rebuilt engine would be assembled tight enough to run into a varnish condition. Inquiry, however, revealed that engines with reconditioned cylinders and new pistons were encountering varnish, usually on the cylinders with the least clearance.

One well-informed investigator is beginning to think that perhaps fuel has something to do with the varnish. In this he gives tetraethyl lead a clean bill of health. His theory is that fuel gets down between the piston and cylinder and between these two cool-

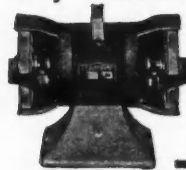


**Will Handle 13 to 15 Tons! — Thornton** Four-Rear-Wheel Drive, engineered into standard ½- to 3-ton chassis—extra capacity, greater traction, double pulling power! Does work of truck twice as large at almost half cost. Write today Thornton Tandem Co., 8701 Grinnell Ave., Detroit.

**THORNTON-eered**  
for TRACTION

## BALDOR BALL BEARING GRINDERS

They WON'T BURN OUT



Ruggedly built. Ball-bearing Capacitor type motor protects against burn-out. Weight, 39½ lbs. Guaranteed 1 year ..... **\$20.50**

BALDOR ELECTRIC CO.  
4340 Duncan Avenue  
ST. LOUIS, MO.

## OUTSTANDING

performance in the  
Automotive Industry



# Trucktor

## CREATES RELIABLE 6 WHEEL TRUCKS

PROFITABLE - ECONOMICAL  
Safest Vehicles On The Road

THE TRUCKTOR CORPORATION  
156 WILSON AVE. NEWARK, N. J.



## HOISTS and DUMP BODIES EVERY SIZE and TYPE for every hauling job

GAR WOOD INDUSTRIES, INC.  
DETROIT, MICH.

Branches and Distributors Everywhere



COVER 70% OF ALL  
MAKES OF TRUCKS  
AND BUSES ARE

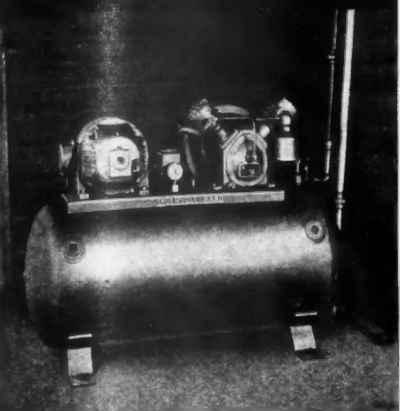
Zollner EQUIPPED

# ZOLLNER

HEAVY DUTY PISTONS

ZOLLNER MACHINE WORKS JOSEPH, INDIANA

# LONG LIFE



I-R Type 30 compressors will give many years of service. This is assured by such features as: a dust-tight crankcase, sturdy construction, stainless steel valves and precision construction.

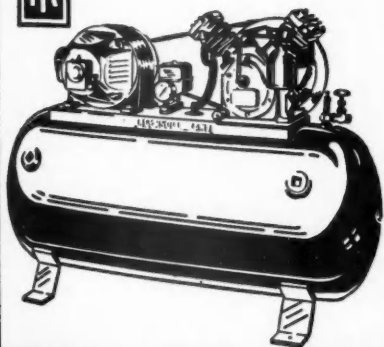
These features mean more years of life and less maintenance expense.

There is a complete range of sizes from  $\frac{1}{4}$  to 10 hp.

Ask the I-R jobber about them and about the I-R Fender and Body straightening tool.



751-3



**Ingersoll-Rand**  
11 BROADWAY, NEW YORK, N. Y.  
**I-R JOBBERS EVERYWHERE**

ing surfaces it is impossible to propagate a flame and that in an ensuing reaction there is formed one of the aldehydes which is one of the bases of bakelite. His reason for leaving tetraethyl lead out of his consideration is that varnish has appeared in Diesels where the fuel is innocent of this substance.

Varnish in a chemical definition is about 25 per cent iron naphthenate and the balance polymerized oil. Now if we take this definition away from the refinery technicians and turn it into layman's language it means that a naphthenic acid is formed in the oil which attacks the iron surface of the engine and forms the naphthenate. Polymerized oil means that the molecular structure of the oil has changed, resulting in larger molecules, which means that a different substance has been created.

No dog cares much what the veterinarian calls a flea. The dog is interested in how to get rid of the fleas and how to keep from getting them again. Fleet operators will stake the oil refiners to any kind of a fancy name they care to give varnish if they will tell them how to get rid of it and how to prevent future appearances.

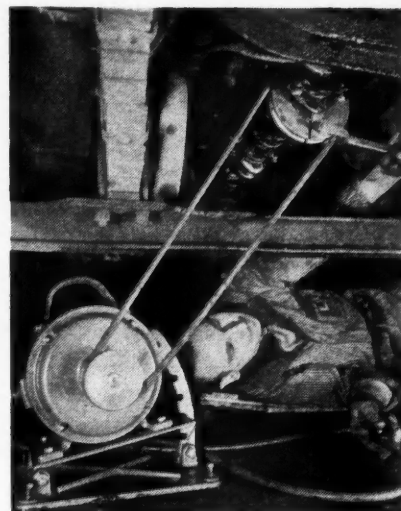
Acetone seems to be the best known solvent. Strangely enough, however, a strong solution of castile soap will remove varnish. Both are applied to the affected part when the engine is disassembled.

At least one fleet operator seems to be getting satisfactory results without disassembly by purging engines with  $\frac{1}{2}$  pt. of a mixture containing the following: 16 qt. methyl acetone, 3 qts. nitro-benzine, 6 qt. xylene and  $1\frac{1}{4}$  lb. naphthalene flakes all added to a light oil in a 1 to 3 ratio. This is fed into a hot engine through a down-draft carburetor or through spark plug ports when the engine is turned over with the starter. He suggests an overnight soaking as best but says 30 min. idling will suffice. Then the crankcase is drained and flushed with flushing oil.

To prevent the formation of varnish all of the following ideas have been suggested at one time or another and probably all of them have merit.

1. Experiment with the selection of oil.
2. Drain crankcase more frequently.
3. Use oil filters.

(TURN TO NEXT PAGE, PLEASE)



*Don't Tear Down  
That Engine . . .*

Keep Payloads  
Rolling with the New  
**LEMPCO**  
**PORTABLE**  
**CRANKPIN**  
**GRINDER**

With a Lempco Portable Crankpin Grinder in your garage you can grind the toughest and hardest of crankpins right in the block in only a fraction of the time ordinarily required to do the job. Once and for all you put an end to costly delays and profiteering, idle equipment. In emergencies the job can be done right at the breakdown — eliminating relief tractors, towing and load transfers — saving you immeasurable time and money.

Take the first step toward stretching your truck mile dollar by mailing in the coupon below.

I'm interested in keeping my trucks rolling. Send me your catalog giving all the details on the new Lempco Portable Crankpin Grinder.

Firm Name.....

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**LEMPCO**  
**PRODUCTS, INC.**  
BEDFORD, OHIO

# A ST. PAUL HYDRAULIC HOIST AND BODY FOR EVERY MODEL OF TRUCK



25 Years of Successful  
Manufacture of Hydraulic  
Hoists for Motor Trucks.

## St. Paul

HYDRAULIC  
HOISTS and BODIES

ST. PAUL HYDRAULIC  
HOIST COMPANY  
2207 University Ave. S. E.  
Minneapolis, Minn.

For running-in new and rebuilt  
engines use auxiliary lubricants  
containing "dag" Brand  
colloidal graphite.

**Acheson Colloids Corporation**

Port Huron  Michigan

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## JONES PORTABLE TACHOMETER



The world's largest  
operators of com-  
mercial vehicles use  
Jones Portable  
Tachometers to  
check engine speeds,  
for tune-ups, and  
setting governors,  
etc. Here are a few:  
Standard Oil Co., of  
La., N. J., N. Y.;  
Shell Petroleum Co.,  
Atlantic Refining  
Company, Tidewater  
Oil Company, Keeshin Motor Express,  
Mack Trucks, Brockway, U. S. Navy.

Direct, instantaneous reading  
**JONES-MOTROLA-STAMFORD, CONN.**  
432 FAIRFIELD AVENUE

## FEDERAL

THE HANDSOMEST TRUCK ON THE ROAD  
37 models . . 3/4 to 8 ton

4 and 6 wheelers

conventional and cab-over-  
engine types

**FEDERAL MOTOR TRUCK CO.**  
Detroit, Michigan

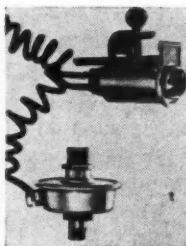
(CONTINUED FROM PAGE 121)

4. Use inhibitors.
5. Check water thermostats and make sure that engine is not operating too hot.
6. Do not be too aggressive in reducing oil consumption by mechanical means.
7. Equip engines with oil coolers.
8. Flush out engines periodically.

Fleet operators will have to experiment with these ideas until such a time as the technicians solve the problem of varnishing at its source. When they will solve it no one can tell, but fleet operators may rest assured that the best minds in the industry are now hard at work on the problem.

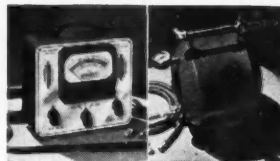
## Safe-T-Eye

A device said to instantly detect low oil level as well as other symptoms of oil failure has been introduced by Pressure Signals, Ltd., Elmhurst, Ill. A compact control unit is installed on the oil pump or oil line and is electrically connected to an indicator light on the dash. A companion device warns of low pressure in the air brake system. For full details, write the exclusive sales agents, J. E. Menaugh Co., 549 West Washington Blvd., Chicago.



Free..

MANY VALUABLE  
TESTING INSTRU-  
MENTS AND SHOP  
TOOLS



in exchange  
for  
Premium  
Coupons  
now on  
every  
box of

## PEDRICK PISTON RINGS

Ask for your copy Free Premium Book

## REPAIR KITS

FOR RECONDITIONING  
Vacuum Power Brake  
Cylinders and Valves  
for **TRUCKS**  
**TRACTORS**  
**TRAILERS**  
**BUSES**

Write for Catalog 16-A covering our complete line. Give jobber's name.

**POWER BRAKE PARTS MFG. & SALES CO.**  
4418 Woodward Ave., Detroit, Mich.

## WAUKESHA

- Comet Diesel
- Hesselman
- Gasoline
- Hy-Powr
- Ricardo Head



## ENGINES



the **HILLMASTER**.. is the only Governor made that releases full engine power on hills regardless of the governed speed.

**WRITE FOR FACTS--** KLEMM AUTOMOTIVE PRODUCTS CO.  
1718 N. Damen Ave. Chicago, Ill.



## Sterling MOTOR TRUCKS

### DIESEL AND GASOLINE

#### GREATER PROFITS

Cost sheets tell the story! Net savings of over \$15,000.00 per truck. An achievement of Sterling Diesel powered motor trucks—trucks which have traveled in excess of one-half million miles and are still in operation.

Be sure of maximum returns on investment. Select Sterling motor trucks for superior performance and lower operating costs. Write for full information.

**STERLING MOTORS CORPORATION**  
MILWAUKEE WISCONSIN

## USE THE DAYTON FUELOMETER

for

### Positive Gas Protection

Accurately records all gasoline consumed by any truck or passenger car.

Write today for the complete story.

**DAYTON FUELOMETER CORP.**  
DAYTON, OHIO

## AUSTIN

THE ACCEPTED STANDARD

### Fifth Wheels

### Landing Gears

### Pintle Hooks

**Austin Trailer Equipment Company**  
Muskegon, Michigan

Manufacturers of Engineered Trailer Products

## KINNEAR TRUCK DOORS

Also Doors for Buildings



**ALL METAL . . .**  
. . . . . Coils like a window-shade, out of the way . . . . .

**CONVENIENT  
BURGLAR PROOF  
FIRE PROOF  
MORE DURABLE**  
Write for Details

**KINNEAR**  
Manufacturing Company  
2100-20 FIELDS AVE.  
COLUMBUS, OHIO

## NEWSCAST

(CONTINUED FROM PAGE 58)

who last fall joined the Monarch Governor Co., as sales manager after 18 years with Ford, has been elevated to the vice-presidency in charge of sales. . . . S. J. Greeb, for 15 years district sales manager of the Boyce Motor Meter Co., has joined the Upper Lubrication Oil Co., Inc., of Brooklyn, N. Y., as a special sales representative.



W. D. Wise, who joined the Fruehauf sales department in 1931, has been named advertising manager of the Fruehauf Trailer Co. He will also supervise sales promotion activities.

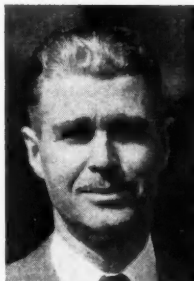
Promotion of four General Tire sales representatives have been made as follows: H. T. Rattigan, in charge of accessory and



H. T. Rattigan (left), and J. J. Muckenhaupt

special product sales, eastern division; J. J. Muckenhaupt, truck tire manager for the eastern division; L. E. Marlowe and J. E. Powers, assistant district managers, New York sales district.

Chester C. Codding, recently named as assistant to the general manager, Willys-Overland Motors, Inc. For the past 15 years he has been connected with various divisions of Chrysler Corp.



Tragedy struck twice recently within the industry. Once to Lawrence M. Viles, chairman of the board of the Buda Co., who died on April 27, and once to A. F. Davis, vice-president of Lincoln Electric Co., so seriously injured in an automobile accident that he was not expected to live. Latest word, however, is good and he is on the way to complete recovery.



## THIS CAN'T HAPPEN WHEN YOU USE AN ALEMITE

### "ROCK CRUSHER"

Model 6528  
Air-Operated



### Exclusive Patented Feature Eliminates Air Pockets!

FLEET owners swear by the Alemite "Rock Crusher"! This amazing grease gun has no equal for fast, dependable, accurate performance—and its exclusive, patented helix arm and worm design positively prevents air pocket trouble!

Holds 40 pounds of lubricant. Delivers heavy fibrous grease at the rate of 14 ounces per minute on 150 pounds of air—at a pressure 33 times the air pressure used. Ruggedly constructed to stand heavy service. Handle serves as hose rack. Three large wheels make it easily portable. Comes complete with 10-foot hose assembly and quick detachable air coupling.

### Also Available for Electric Power

Model 6524 "Rock Crusher" has the same exclusive, patented helix arm and worm, and is equipped with heavy duty universal electric motor for use with either AC or DC. Delivers 9½ ounces of grease per minute under 5000 pounds pressure per square inch.



Dependable lubrication is cheaper than repairs and layoffs. Investigate the complete line of Alemite Equipment, and learn how much the right Alemite Gun can save you over a year's time—not only in lubrication and maintenance costs, but in longer life and trouble-free service from your equipment. Write for information!

## ALEMITE

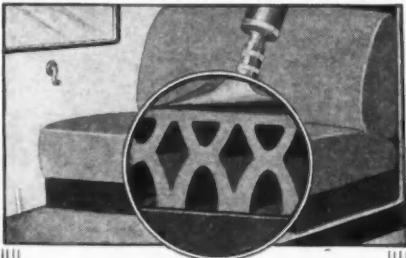
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A Division of Stewart-Warner Corporation  
1876 Diversey Parkway, Chicago, Ill.

Stewart-Warner-Alemite Corporation  
of Canada, Ltd., Belleville, Ontario

WORLD'S LARGEST MANUFACTURER OF  
LUBRICATION PRODUCTS

## Black Diamond All-Rubber SEAT CUSHIONS Built for ALL Conditions



Hard-boiled tests by fleet owners everywhere have definitely established proof that Black Diamond all-rubber semi-sponge seat cushions and back rests don't give out under the toughest kind of gruelling service. It's the scientifically designed exclusive diamond grid construction that makes these cushions outwear, out-last and give greater riding comfort than other types. They're modest in cost and are designed to fit ANY type of truck. Let us give you more information!

**KARPEX MANUFACTURING CO.**

1426 E. 19th St., Indianapolis, Ind.

## Available Trucks

Builders of fine Motor Trucks, Tractors, Trailers and Buses since 1910.

Capacities from 1½ to 10 tons.

Write for bulletin

**AVAILABLE TRUCK COMPANY**

2501 Elston Ave. Chicago, Illinois

THUMB-SCREW ADJUSTMENT  
BALANCED (2-SIDE) PULL  
OVER LAPPING SEAL

**TRADE MARK**  
**NOC-OUT**  
HOSE CLAMPS

THE HOSE CLAMP WITH THE THUMB SCREW

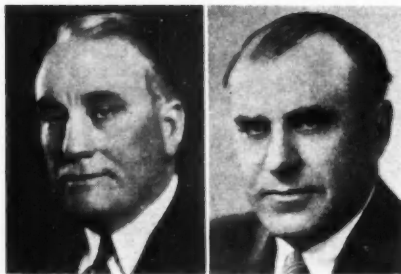
Seals absolutely against leakage of antifreeze, radiator connections, or heater hose. Type A Adjustable, the Clamp with the thumb screw, 1 size fits many. Type GHH for heater hose. Type GBB for Booster Brakes.

**WITTEK MFG. CO.**  
4305 W. 24th Pl., Chicago, U.S.A.

ONE SIZE FOR MANY  
ADJUSTABLE FOR SIZE

### Georgia Diesel Tax

To date relatively few diesel-powered trucks have found a permanent home in Georgia. Hence the subject of diesel fuel taxes had not yet been settled when our Fleet Operator's Reference Annual summed up the diesel tax situation in April. But last month came an appendage from Georgia's Department of Revenue—"Diesel fuel when used upon the highways for the propulsion of internal combustion motors—6 cents." This is the same as the state's gasoline tax.



S. B. Cochrane and C. H. Monahan, Studebaker regional managers in South Bend and Omaha received bronze plaques recently commemorating 15 years with the company

### du Pont to Market Ethylene Glycol

And speaking of anti-freeze, a flash just over the wire has it that du Pont is building an ethylene glycol plant at Belle, W. Va. According to the report the plant will not only supply the company's present needs, but will furnish the product to the Zerone Division for sale as an anti-freeze.



Peter Zientek, Eloyd Jacobson and Howard Hagerly won safety awards recently for a combined total of 1,500,000 accident-free miles. They're ace drivers for Fruehauf-equipped Barry Transfer of Milwaukee

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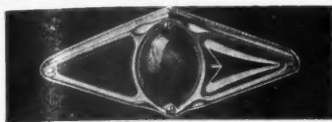
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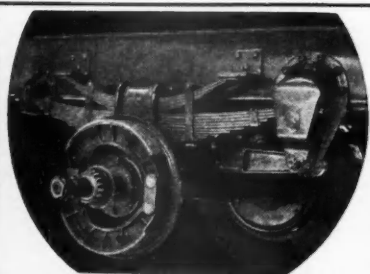
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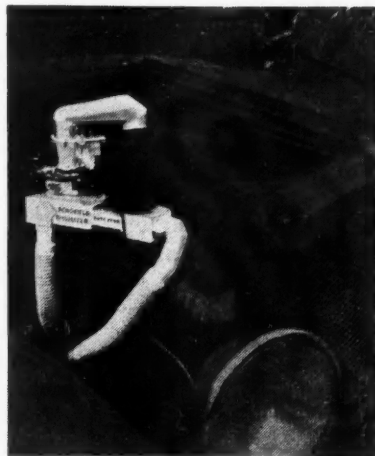
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JUNE, 1939

## NEW PRODUCTS

(CONTINUED FROM PAGE 62)

### Schofield Dieselizer

Dieselizer Corp. of America, Van Nuys, Cal., has announced the Schofield Dieselizer. This device is for application on gasoline engines to make it possible for them to operate on fuel oils or distillate.



The unit provides an auxiliary fuel system for the engine. There are two accelerator pedals and gasoline or the heavy fuel can be used at will by merely depressing the correct pedal. The regular gasoline fuel system is used for starting and warming up in normal service. Water is metered into the heavy fuel when it is used, as an anti-knock.

### Wheel Bearing Lubricator

To insure maximum efficiency in the lubrication of automobile and truck wheel-bearings, a new-type wheel-bearing lubricator is now being manufactured by the Alemite Division of the Stewart-Warner Corp., Chicago. It is adaptable to both



ball and roller wheel-bearings on all modern makes of passenger cars and trucks and assures uniform distribution of the lubricant within the bearing. For full details, address Stewart-Warner Corp., 1826 Diversey Parkway, Chicago.

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